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Pharmacy-Based Barriers to Adolescent Access to Over-the-Counter Emergency Contraception in Kentucky

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PHARMACY-BASED BARRIERS TO ADOLESCENT ACCESS TO OVER-THE-
COUNTER EMERGENCY CONTRACEPTION IN KENTUCKY

A Thesis
Presented to
The Faculty of the Department of Public Health
Western Kentucky University
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of the Requirements for the Degree
Master of Public Health

By
Zona Josephine Ascensio

May 2017

PHARMACY-BASED BARRIERS TO ADOLESCENT ACCESS TO OVER-THE-COUNTER EMERGENCY CONTRACEPTION IN KENTUCKY

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This thesis is dedicated to my daughter, Sonora Audrey Ascensio. She is forever my sunshine, my source of joy and inspiration, and my biggest fan. Without her love and encouragement, nothing I have achieved would have been possible.

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TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION TO THE STUDY	1
Emergency Contraceptives	4
The Regulatory History of Levonorgestrel	5
Barriers to Emergency Contraception Access	8
Economic Barriers	8
Physical Barriers	9
Pharmacy Staff Lack of Knowledge	9
Pharmacy Staff Beliefs	10
Need for Further Study	11
Purpose of the Study	12
CHAPTER 2: REVIEW OF LITERATURE.....	15
Varieties and Mechanisms of Emergency Contraception	15
Ethical, Social and Political Considerations	18
Barriers: Economic and Physical	19
Barriers: Pharmacy Staff's Lack of Knowledge	23
Barriers: Pharmacy Staff's Beliefs.....	27
Need for Further Study and Public Health Interventions.....	29
CHAPTER 3: METHODOLOGY	37
Study Design and Justification.....	38
Sample and Sampling Frame	39
Confidentiality	40
Call Scripts and Data Collection.....	41
Measures	42
Characteristics of Pharmacy and Respondents	42
Physical and Economic Accessibility of EC.....	44
Pharmacy Staff Knowledge of EC	45
Attitudes of Pharmacy Staff as Perceived by Caller	49
CHAPTER 4: RESULTS.....	51
Descriptive Results	51
Characteristics of Pharmacy and Respondents	51
Physical and Economic Accessibility of Emergency Contraception	51
Pharmacy Staff Knowledge of Emergency Contraception	52

Perceived Attitudes of Pharmacy Staff	53
Inferential Results	54
Associations/Differences between Rural and Urban Pharmacies	55
Associations/Differences between Chain and Private Pharmacies	56
Associations/ Differences between Pharmacists and Pharmacy Technicians	58
Factors on Likelihood of Pharmacy Carrying Emergency Contraception	59
Urban or Non-Urban Location on Likelihood of Pharmacy Being Chain or Private.....	61
Factors on Pharmacy Staff Knowledge of Emergency Contraception.....	61
Factors on Perceived Negative Attitude of Pharmacy Staff.....	63
Additional Comments	65
CHAPTER 5: DISCUSSION AND RECOMMENDATIONS.....	67
Physical and Economic Barriers to Emergency Contraception	67
Pharmacy Staff-Associated Barriers to Emergency Contraception	69
Barriers Created by Lack of Knowledge among Pharmacy Staff	69
Pharmacy Staff Attitudinal Barriers.....	71
Pharmacy Technicians vs. Pharmacists	71
Study Strengths	72
Study Limitations.....	73
Recommendations.....	74
CHAPTER 6: CONCLUSION.....	79
Appendices.....	85
Appendix I: Flow Chart of Survey Instrument	86
Appendix II: Significant Differences/ Associations Between Urban & Rural Pharmacies	88
Appendix III: Significant Differences/ Associations Between Chain & Private Pharmacies....	93
Appendix IV: IRB Letter of Approval	97
Curriculum Vitae	98
References	103

LIST OF TABLES

Table 1: Descriptive Characteristics of Pharmacies and Respondents	51
Table 2: Descriptive Information of Physical and Economic Accessibility to EC.....	52
Table 3: Descriptive Information of Pharmacy Staff Knowledge about Over-the-Counter EC.....	53
Table 4: Descriptive Information Perceived Attitudes of Pharmacy Staff	54
Table 5: Significant Associations/Differences Based on Urban/Rural Pharmacies.....	56
Table 6: Significant Differences and Associations Based on Chain/Private Pharmacies	58
Table 7: Associations/Differences Based on Job Title.....	59
Table 8: Logistic Regression Results- Factors on Likelihood of Carrying EC	60
Table 9: Linear Regression Results- Factors on Overall Knowledge of EC	63
Table 10: Linear Regression Results- Factors on Negative Attitude of Pharmacy Staff	65

PHARMACY-BASED BARRIERS TO ADOLESCENT ACCESS TO OVER-THE-COUNTER EMERGENCY CONTRACEPTION IN KENTUCKY

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Since June of 2013, Plan B and its generics have been available over-the-counter without age restriction nationwide. Even so, pharmacy-based economic, physical, and staff-associated barriers still exist, potentially leading adolescent customers to fail to obtain emergency contraception (EC) in a sufficiently timely manner to prevent pregnancy. This study explores these pharmacy-based barriers to EC in the state of Kentucky focusing on comparisons of urban and non-urban pharmacies and chain and private pharmacies. Using a secret-shopper survey technique, the researcher called 220 Kentucky pharmacies acting as a 15-year-old girl seeking information about EC. Among other findings, a logistic regression analysis revealed that private pharmacies were 97% less likely to carry EC compared to chain pharmacies (OR= .027; $p<.001$). Linear regression analyses found that urban pharmacies scored higher on EC knowledge ($\beta=.608$; $p<.05$) and lower on negative attitude ($\beta= -.622$; $p<.01$) than rural pharmacies. This research reveals that rural Kentucky adolescents face more barriers when seeking EC than urban teens. It also demonstrates that whether a pharmacy is a chain or privately-operated is a better predictor of whether it will carry over-the-counter EC than urban or rural location alone. Further, it supports the argument for more pharmacy-staff training to effectively counsel those seeking EC and for better promotion of the EC and other family planning resources available through the public health system.

Chapter 1

INTRODUCTION TO THE STUDY

Nearly half of all pregnancies in the United States are unintended (Guttmacher Institute, 2016a). Women with unintended pregnancies are more likely to have less access to prenatal care and to experience adverse health outcomes including low birth weight, developmental delays, and infant and maternal mortality (Dehlendorf, Rodriguez, Levy, Borrero, & Steinauer, 2010). These problems are compounded for adolescent mothers who often forgo educational and occupational opportunities, contributing to even further disparities of opportunity for their children (Dehlendorf, et al., 2010). The 2010 U.S. Census shows that 68% of unplanned births were paid for by public health programs, especially Medicaid (Guttmacher Institute, 2016a). In response to these outcomes, the U.S. Department of Health and Human Services' Healthy People 2020 plan aims to lower unintended pregnancy by 10% by 2020 (HHS, 2014). To achieve this goal, it is necessary to understand factors contributing to unintended pregnancy. Among these factors is the availability of emergency contraception to women in general and to adolescents in particular.

More than four out of five pregnancies among American females aged 19 and younger are unintended and nearly all (98%) pregnancies among teens younger than 15 are reported as unintended (Finer & Zolna, 2011). In the United States overall, the 2011 birth rate for adolescents aged 15-17 years was 15.4 per thousand, while the rate for Kentucky teens aged 15-17 years was 19.6 per thousand (HHS, 2016). The U.S. teen birth rate fell by 49% from 1991 to 2011, while the Kentucky teen birth rate fell by only

37% over the same period (HHS, 2016). In 2008, 64% unintended pregnancies in Kentucky were described as mistimed, but 36% were described as “unwanted,” a number lower only than New York State at 37% (Kost, 2015). Even so, the percentage of unintended pregnancies in Kentucky ending in abortion was 20%, one of the lowest in the nation (Kost, 2015).

Lower educational attainment and lower socio-economic status are correlated to higher rates of unintended pregnancy. In 2011, the rate of unintended pregnancy for women below the federal poverty level was nearly seven times higher than for women at 200% of the federal poverty level or higher (Guttmacher Institute, 2016a). Furthermore, women without a high school degree had the highest rate of unintended pregnancy; this rate decreased with every additional year of education attained (Guttmacher Institute, 2016a). Many women report gaps in contraceptive usage due to life-events which disrupt their routines. These events include moving to a new home, changes in employment or relationship status, or life crises. Such transitional life events are more common for women in lower socio-economic living conditions or with lower educational attainment (Frost, 2011).

Similarly, women of color also have higher rates of unintended pregnancy. Recent surveys indicate that about 69% of Black women’s pregnancies were unplanned and 54% of Hispanic women’s pregnancies were unplanned, compared to 40% of White women’s pregnancies reported as unplanned (Dehlendorf, et al., 2010). Additionally, Hispanic women, especially recent immigrants with limited English language skills, have less knowledge than do White women of the varieties of and proper use of available contraceptives (Craig, Dehlendorf, Borrero, Harper, & Rocca, 2014).

The problems these at-risk population groups experience in accessing contraception are amplified for adolescent females who share similar demographic characteristics (Dehlendorf, et al., 2010). Adolescents will likely face the same barriers to EC access that adult women do, though these are compounded. For example, adult women may need to pay for contraceptives and travel to a health care provider or a pharmacy for contraceptives. They may also face barriers to access related to geographic availability or conflicting beliefs of potential providers. Adolescents seeking contraception without their parents' support may encounter these barriers as well as greater limits on personal finance, less access to transportation, and greater opposition from prospective providers of contraceptive products and services (Guttmacher Institute, 2016c). Three additional barriers are higher for teens: confidentiality in accessing contraception (Guttmacher Institute, 2016b), the legal right to access contraception without parental consent (Guttmacher Institute, 2016c), and the lack of opportunity to learn about contraceptive methods (Stanger-Hall & Hall, 2011).

Only twelve states have laws protecting the medical privacy of adolescents insured as dependents (Guttmacher Institute, 2016b). Parents often learn of their minor and adult children's contraceptive access in Explanation of Benefits (EOB) forms which disclose any services provided to any beneficiary of the insurance plan (Guttmacher Institute, 2016c). This can effectively eliminate insurance coverage for contraceptives for minors with parents opposing their access. In many states, minors cannot legally offer consent to services necessary to receive contraception from health care providers without parental approval. For example, in Connecticut, Indiana, Louisiana, Michigan, Nebraska, or South Dakota, a minor can only offer consent to treatment if they are married;

Oklahoma and New Jersey additionally allow minors to consent if they have already been pregnant, though not before they become pregnant (Guttmacher Institute, 2016c).

Uniquely, in Mississippi a minor can give consent to receive contraceptive services if they have a letter from their clergy affirming their suitability to receive contraception (Guttmacher Institute, 2016c).

Emergency Contraceptives

Single dose levonorgestrel products, marketed as Plan B One-Step by Teva Pharmaceuticals and under various generic names (Take Action, Next Choice One-Dose, My Way), are the most widely available and most commonly used of the three forms of emergency contraception in general use in the United States today (American Society for Emergency Contraception, 2013). Plan B One-Step costs about \$48.00 while generic versions average \$41.00 (American Society for Emergency Contraception, 2013). Plan B One-Step and its generics consist of a single dose, 1.5 mg levonorgestrel tablet which is easy to use and rarely causes severe side-effects. The most commonly reported side-effects are headaches, nausea and vomiting, and menstrual irregularity. Side-effects are generally mild and short-lived. Levonorgestrel is intended to be used within 72 hours for greater likelihood of preventing pregnancy. The drug is more effective the sooner after intercourse it is taken. Efficacy drops constantly every hour following sex, but pregnancy may be prevented when the dose is administered up to 120 hours after intercourse (Gemzell-Danielsson, Berger, and Latikumar, 2012). Unlike mifepristone, levonorgestrel is not an abortifacient and has no effect on a fertilized ovum (American Society for Emergency Contraception, 2013).

Ulipristal acetate is a single dose, prescription-only alternative to levonorgestrel. Ulipristal is more effective as an emergency contraceptive in that its efficacy remains high for the full 120 hours following intercourse (Cleland et al., 2014). Like Levonorgestrel, ulipristal blocks fertilization of the ovum. However, ulipristal has significant contraindications and is inappropriate for women with renal disease, severe asthma, or galactose intolerance; ulipristal has also not been as thoroughly studied in adolescents (Koyama, Hagopian, and Linden, 2013). The fact that a prescription is required and use is thereby likely to be delayed prevents wider use of ulipristal. The most effective emergency contraceptive available is the copper intrauterine device (or IUD) (Cleland et al., 2014). IUDs may be simple copper or may be embedded with levonorgestrel. In either case, the copper ions released by the device are highly effective in preventing fertilization of the ovum (Cleland, Raymond, Westley, and Trussell, 2014). However, the necessity for the IUD to be inserted in a timely manner in a clinical setting prevents more frequent use as an emergency contraceptive (Cleland et al., 2014). A thorough description of the chemical mechanisms of action of levonorgestrel, ulipristal acetate, and intrauterine devices follows in Chapter 2.

The Regulatory History of Levonorgestrel

As early as the mid-1960s, doctors administered high doses of estrogen to rape victims to prevent pregnancy. In the 1970s, the safer Yuzpe method was developed which combined progestin with a lower dose of estrogen. In 1998, the U.S. Food and Drug Administration approved the Preven Emergency Contraception Kit consisting of two pills (0.25 mg levonorgestrel and 0.05 mg estradiol) to be taken immediately and a second dose of two pills to be taken 12 hours later (Stacey, 2014). In 1999, this was further

improved upon with the approval of levonorgestrel-only Plan B One-Step. In February 2001, the Center for Reproductive Rights filed a petition with the FDA to make Plan B available over-the-counter. In December 2003, the FDA's Nonprescription Drugs committee and the Reproductive Health committee each unanimously ruled that Plan B was safe and effective (Stacey, 2014).

Even so, in May 2004, the Food and Drug Administration denied Plan B's manufacturer permission to begin sales due to concerns about adolescent sexual behavior and health. In June of 2004, Senators Hillary Clinton and Patty Murray requested a General Accounting Office audit of the FDA's decision. In July, Plan B's manufacturer submitted a revised request for over-the-counter status for women age 16 or older (Stacey, 2014). In January 2005, in response to the FDA's failure to rule on the over-the-counter status of Plan B, Senators Clinton and Murray blocked President Bush's nominee Lester Crawford to FDA commissioner. The senators lifted their hold after being assured that the FDA would rule on the matter by September 1, 2005. Instead, on August 26th, Commissioner Crawford postponed the decision citing a need for public comment, overruling the FDA's own experts (Stacey, 2014). Under pressure from the U.S. Senate and the GAO, Crawford resigned after just two months as commissioner. President Bush nominated his own former physician Andrew von Eschenbach to head the FDA. Senators Clinton and Murray blocked von Eschenbach's appointment and demanded a decision on Plan B. In June of 2006 the FDA formally denied the Center for Reproductive Rights' petition and on August 24, 2006 announced that Plan B would only be available over-the-counter to women 18 and older (Stacey, 2014).

In March of 2009, ruling in *Tummino vs. Torti*, Judge Edward Korman ruled that the Food and Drug Administration's denial of the Center for Reproductive Rights petition was "arbitrary and capricious" and ordered the FDA to allow 17 year olds over-the-counter access to Plan B (Stacey, 2014). The FDA did so in July 2009 as part of the introduction of Plan B One-Step, the one pill levonorgestrel formulation. One-Step was made available to both women and men age 17 and older without prescription and production of the older multi-pill formulas ended that summer (Stacey, 2014).

In February 2011, Plan B's manufacturer requested that One-Step be sold over-the-counter without age restriction. In December, the Food and Drug Administration approved this request only to be immediately overruled by Kathleen Sibelius, Secretary of the Department of Health and Human Services. Secretary Sibelius argued that more research should be done before making Plan B One-Step available to young adolescents (Stacey, 2014). In February 2012, Judge Korman ordered the FDA to show cause for not making Plan B available over-the-counter. On April 5, 2013 Korman reversed the FDA's rejection of the Center for Reproductive Rights' citizen petition and ordered the FDA to approve levonorgestrel EC products for OTC sale without age restriction within 30 days. On April 30, the FDA instead ruled that Plan B One-Step would become available on pharmacy shelves for women age 15 and up (Stacey, 2014). On May 1, 2013 the Justice Department appealed Judge Korman's order to make levonorgestrel products over-the-counter without restriction; Korman denied the appeal. On May 13th, the Justice Department appealed to the Second U.S Circuit Court and was again denied. On June 20, 2013 the Food and Drug Administration approved Plan B One-Step to be sold over-the-counter and on store shelves to women and men without age or identification

requirements. On February 25, 2014 the FDA also approved generic levonorgestrel products to be sold over-the-counter and on store shelves without restriction, though packaging still stated that the product was intended for ages 17 and older (Stacey, 2014).

Barriers to Emergency Contraception Access

Several barriers may prevent access to emergency contraception. While lack of knowledge of the existence of EC, of how to obtain EC, or of the timing limits for successful use of EC could limit a potential user's access to and timely use of EC, these barriers are beyond the scope of this thesis. Rather, this thesis will focus on pharmacy-based barriers to EC access. Once a young woman has decided to seek emergency contraception, several factors may prevent her from obtaining EC from a pharmacy in a timely manner (Mackin and Clark, 2011). For the purpose of this thesis, these barriers to access can be characterized as economic barriers, physical barriers, and staff-introduced barriers such as lack of knowledge on the part of pharmacy staff and beliefs of pharmacy staff which may motivate them to prevent access to EC.

Economic Barriers

The cost of emergency contraception presents a barrier to access for many women. This is especially the case for adolescents who may attempt to purchase EC without their parents' permission (Guttmacher Institute, 2016c). The average cost of Plan B One-Step (\$48) or generic levonorgestrel (\$41) (American Society for Emergency Contraception, 2013) is generally covered by insurance, but adolescents may not have access to their own insurance cards or may believe that the insurance charges will be visible to their parents. Also, some insurers may not pay for the drug if not prescribed by a physician (American Society for Emergency Contraception, 2013). One recent study indicated that public subsidies of oral contraceptives more than pay for themselves in

savings of subsidized pregnancy-related costs (Foster, Biggs, Phillips, Grindlay, and Grossman, 2015).

Physical Barriers

Some physical barriers exist within pharmacies themselves. For example, given the economic barriers associated with EC, products such as Plan B may be considered high-theft items and therefore kept in an enclosed case or behind the pharmacist's counter (American Society for Emergency Contraception, 2014). Also, many pharmacies have reported not carrying EC products due to low demand (Mackin and Clark, 2011). It is unknown to what extent not regularly carrying EC may discourage customers from expecting to find the product and entering the store to obtain it, thus reinforcing the pharmacist's perception of a lack of demand. On a similar note, while the pharmacy may only be temporarily out of stock of the product, since the efficacy of emergency contraceptives drops continually following the time of intercourse, any delay is a substantial barrier (Gemzell-Danielsson, et al., 2012). Alternatively, women may need to travel long distances in rural areas or via difficult public-transit routes in urban areas to reach a pharmacy with EC in-stock. These are also pharmacy-based physical barriers, though they are external to the pharmacy.

Pharmacy Staff Lack of Knowledge

Researchers have found lack of knowledge on the part of pharmacists and other pharmacy staff to be the source of significant barriers to access of emergency contraception for adolescents and for women generally (Gaffaney, Stamm, Borgelt, Chau, Rupp, Blumhagen, and Gilroy, 2015). The foremost barrier to access for adolescents arising from lack of knowledge is that pharmacy staffs are often unaware of the fact that levonorgestrel products are now available without prescription for any individual

requesting them (Wilkinson, Vargas, Fahey, Suther, and Silverstein, 2015). An associated barrier is the improper demand for personal identification. Pharmacists and other pharmacy staff also are often unaware that men can legally purchase emergency contraception. Multiple studies have recognized the important role male partners and other allies can play in assisting young women in obtaining EC (e.g., Fallon, 2010; Schrager, Olson, Beharry, Belzer, Goldsich, Desai, and Clark, 2014). Also, staff lack of knowledge can present a barrier to access to the proper form of EC for a given patient. Studies have shown significantly decreased efficacy of levonorgestrel products in obese women; these patients should be directed to seek other forms of emergency contraception instead of or in addition to levonorgestrel (Gaffaney, et al., 2015).

Pharmacy Staff Beliefs

Though economic barriers, physical barriers, and barriers arising from lack of knowledge among pharmacy staff are significant limiting factors to EC access, the beliefs of pharmacists and other pharmacy staff may present some of the barriers to access for adolescents seeking emergency contraceptives. Studies of the availability of EC in southern and western states have shown substantial barriers to access, especially in rural areas (e.g., Mackin and Clark, 2011; Samson, Loren, Downing, Schroepfel, Kelly, and Ramaswamy, 2013; Gaffaney, et al., 2015). Recent surveys of pharmacists' attitudes have indicated that this lack of access is not the product of economic or physical barriers alone (Richman, Daley, Baldwin, Kromey, O'Rourke, and Perrin, 2012). A lack of knowledge on the part of pharmacy staff has been shown to be correlated to beliefs that would tend to indicate opposition to EC access and a desire to erect barriers to access (Wilkinson, Vargas, Fahey, Suther, and Silverstein, 2014). In the absence of a proper scientific understanding of the chemical mechanism of levonorgestrel products, pharmacists may

rely on their moral beliefs concerning abortion to make decisions effecting access to EC by adolescent girls and women generally(Wilkinson, et.al., 2014). Despite recent and extensive research asserting that levonorgestrel poses no teratogenic effects and cannot function as an abortifacient (e.g., Glasier, 2013; Gemzell-Danielsson, 2012), multiple studies show pharmacists to believe that Plan B and its generics induce abortion and can cause birth-defects when not successfully preventing pregnancy (Richman, et al., 2012; Mackin and Clark, 2011).

In addition to doubts about levonorgestrel's safety when used as directed, pharmacists have reported doubt that adolescent females can successfully understand directions for use of the product and that over-the-counter EC is therefore not safe for use by adolescents without the direction of parents or medical professionals (Richman, et al., 2012). Also, in addition to the well documented safety of levonorgestrel products, multiple studies have found that adolescents are indeed capable of understanding the directions for proper use and of using the product properly with a negligible rate of complication (Raine, Ricciotti, Sokoloff, Brown, Hummel, and Harper, 2012; Manski and Kottke, 2015). Along with beliefs relating to supposed abortifacient and teratogenic properties, belief that adolescents cannot understand how to swallow a single pill correctly may derive much more from pharmacists' personal beliefs than from experience or formal training (Wilkinson, et al., 2014).

Need for Further Study

The relevant literature describes many barriers to access to emergency contraception and its effective use. These studies leave many unanswered questions. For example, many studies of EC availability in urban and rural areas, though published

recently, are based on data collected before the 2013 FDA regulatory change of the legal age for over-the-counter access. Studies of access in urban areas vs. in rural areas have been conducted in Iowa and Kansas, states which may not be demographically representative of many others. Conversely, studies of urban barriers to EC have been conducted in New York City, but have not, for example, included comparisons to access in rural areas such as upstate New York.

In addition to the need for more study of barriers related to emergency contraception, there is even greater need for study of barriers to adolescent access. The relevant literature demonstrates that sexually active and potentially active female adolescents have a severe lack of understanding of the availability of EC and face much greater barriers to access than do adult women (Yen, Parmar, Lin, and Ammerman, 2015). Pharmacy based studies of adolescent access to EC have been conducted in Iowa, Kansas, and Wyoming but not in the American south. Among southern states, only Florida has been the subject of a statewide survey of pharmacists' knowledge of and attitudes toward EC. To date, no studies have considered barriers to adolescent access to Emergency Contraception in Kentucky.

Purpose of the Study

The purpose of this study is to gather previously unavailable information on the barriers to access of Emergency Contraception for adolescents in Kentucky. The specific research questions addressed by this study are as follows:

1. Are there differences in/associations between affordability, physical accessibility, pharmacy staff knowledge and pharmacy staff attitudes based on whether a pharmacy is rural or urban?

2. Are there differences in/associations between affordability, physical accessibility, pharmacy staff knowledge and pharmacy staff attitudes based on whether a pharmacy is chain or privately owned?
3. Do factors such as whether a pharmacy is chain or privately operated or whether it is urban or rural predict a pharmacy's likelihood of carrying EC?
4. Do factors such as whether a pharmacy is chain or privately operated or whether it is urban or rural predict the level of EC knowledge among pharmacy staff?
5. Do factors such as whether a pharmacy is chain or privately operated or whether it is urban or rural predict the level of negative attitudes demonstrated by pharmacy staff?

The study will attempt simulate the experience of an adolescent female seeking access to over-the-counter emergency contraception in Kentucky pharmacies. This goal will be achieved through a series of “secret-shopper” telephone interviews in which the researcher presents herself as a 15-year-old girl asking questions about the “morning after pill.” As the first study of its kind to be conducted in Kentucky, it will provide greatly needed information on the availability of over-the-counter emergency contraception in the state in generally and specifically for female adolescents. This research will not only help identify any specific areas for intervention relating to adolescent access to EC in Kentucky pharmacies, but it also has the potential to provide a framework for further study of the nature of barriers to access in this and other states. Finally, the study will

contribute to ongoing efforts to collect a larger body of data needed to improve current understanding of access to emergency contraception in the entire United States.

Chapter 2

REVIEW OF LITERATURE

The relevant literature on Emergency Contraception and over-the-counter EC availability includes recent work clarifying the chemical mechanism of the available types of EC; the ethical, social, and political factors related to the use and accessibility of EC; and research into the barriers to over-the-counter EC access for all women and specifically for adolescents. The literature also includes several studies which serve to highlight specific needs for further study and public health interventions.

Varieties and Mechanisms of Emergency Contraception

The most recent peer-reviewed data available on the chemical mechanism and efficacy of available forms of Emergency Contraception, including levonorgestrel, ulipristal acetate, and intrauterine devices, is summarized and discussed by Cleland and colleagues (2014). Levonorgestrel is the most readily available of the three primary emergency contraception options. Levonorgestrel is available as a single dose, 1.5 mg pill or less commonly as two .75 mg pills. It has been sold over-the-counter as Plan B One-Step (one dose) since 2009 and since August 2013 has been sold without age restrictions (Cleland, Raymond, Westley, and Trussell, 2014). In February 2014, generic versions of levonorgestrel were approved to be sold under the same conditions. Prescription only ulipristal acetate 30 mg has been available since 2010 as Ella. Though Ella is apparently slightly more effective than levonorgestrel, it is not yet available over-the-counter (Cleland, et al., 2014).

Over-the-counter levonorgestrel has been found 81%-90% effective when taken within the recommended timeframe of up to 72 hours (Kaiser Family Foundation, 2016).

Researchers have found that levonorgestrel use failed to prevent 0.6% - 3.1% pregnancies in clinical trials, while ulipristal was effective in all but 0.9 – 2.1% of uses in clinical trials. Ulipristal users were, on average, 42% less likely to become pregnant than levonorgestrel users (Cleland, et al., 2014). Levonorgestrel has been demonstrated to delay luteinizing hormone surge if used before ovulation but is not effective thereafter. Unlike ulipristal, levonorgestrel cannot prevent follicular rupture or implantation of a fertilized ovum. Unlike the abortifacient drug mifepristone, levonorgestrel has no effect on an implanted, fertilized ovum and therefore has no abortifacient properties (Cleland, et al., 2014).

The third most common emergency contraceptive method is the copper intrauterine device. The IUD may be implanted up to five days following intercourse to prevent pregnancy, though as with all EC methods, efficacy falls rapidly over that time period. Copper IUD's may or may not be impregnated with levonorgestrel; studies are underway to determine the additional efficacy of this combination. Without an added contraceptive drug, the copper ions in the IUD are believed to both interfere with sperm function and induce inflammatory response in the uterine tissue, preventing pregnancy via multiple mechanisms (Cleland, et al., 2014). This would explain the high efficacy of the copper IUD. Though IUD implantation is the most effective of all EC methods available (greater than 99.9% effectiveness) it is also the most difficult to obtain in a timely and affordable manner and is thus also the least commonly used (Cleland, et al., 2014). An extensive review of the current understanding of the chemical mechanisms of these three forms of emergency contraception and also of mifepristone is available in Gemzell-Danielsson, Berger, and Latikumar (2012).

Researchers have found higher body weight to reduce the efficacy of oral emergency contraceptives. Levonorgestrel may be much less effective for women with BMIs above 26. Drugs which reduce the effectiveness of other oral contraceptives are believed to lower the effectiveness of levonorgestrel, though to what extent, given the high dose administered in EC formulations, is unknown (Cleland, et al., 2014). Both body weight and drug interactions which apparently lower efficacy need further study.

Despite these limitations, side effects are relatively mild and pass quickly in most cases. The most common side effects reported were nausea and menstrual irregularity. No serious complications or deaths have been linked to oral emergency contraceptive use and levonorgestrel poses no known serious health risks to women or teratogenic risks to children born in case of failure of the drug to prevent pregnancy. Oral EC is, in fact, known to be safer than IUD insertion for women with pelvic inflammatory disease, cervicitis, chlamydia, or active gonorrhea (Cleland, et al., 2014).

Koyama, Hagopian, and Linden (2013) have presented further possible contraindications for ulipristal and thus reaffirmed the greater relative safety of levonorgestrel. Among these are glucocorticoids, which are used to treat asthma and which may be rendered ineffective by ulipristal. The authors also list several drugs which may decrease the effectiveness of ulipristal, including barbiturates, carbamazepine, oxcarbazepine, phenytoin, rifampin, St. John's Wort, and several anti-retrovirals (Koyama, Hagopian, and Linden, 2013).

Glasier (2013) focuses on clinical outcomes of levonorgestrel and other emergency contraceptive methods. This meta-analysis found that levonorgestrel, like other progestogens, is exceptionally safe with an extremely low risk of adverse effects.

The author found no evidence of higher risk of ectopic pregnancy or birth defects due to levonorgestrel use and no evidence of adverse developmental effects for adolescents using the drug. The study also showed that side effects such as dysmenorrhea, fatigue, abdominal pain, nausea, and headache are no greater for levonorgestrel users than for participants in control groups taking no medications who were asked to keep daily diaries of such minor complaints (Glasier, 2013).

Ethical, Social and Political Considerations

Lewis and Sullivan (2012) writing in *Ethics and Medicine* considered the ethical arguments for health care providers and pharmacy staff to refuse to provide emergency contraceptives such as levonorgestrel which have been specifically shown to have no abortifacient properties. Having reviewed all available studies on levonorgestrel's chemical properties and mechanism, they found that moral claims based on belief that EC functions as an abortifacient are fully baseless and untenable. They argue that such a refusal of care has no basis in medical ethics (Lewis and Sullivan, 2012).

Price (2011) considered the role of sexual ethics and personal mores in the construction of public policy concerning access to emergency contraception for adolescents and found that desires to maintain parental authority and expectations of sexual "purity" for teenage girls have been the primary causes for the subordination of health policy to personal ethics. The author identified culturally and religiously based fears and anxieties as giving rise to extreme discomfort with the existence of adolescent sexuality. Parents tend to explain that providing access to contraceptives implies adult permission for sexual activity. The author advocated acceptance of the fact of adolescent

sexuality and the formulation of public policy on that basis rather than attempts to placate parents' discomfort with teen sexual activity (Price, 2011).

A similar argument is made by Thompson and colleagues (2013). The authors discuss the past regulation of emergency contraception on the basis of political influences and social concerns rather than medical fact and public health data. Their argument, however, focuses more on the overwhelming scientific research in favor of permitting unrestricted access to oral emergency contraceptives. The authors note that a 2009 study found that fewer than one in ten thousand EC users were younger than age 13. They also review data specifically on the safety of Plan B One-Step for adolescents aged 13-16 and find age restrictions to be medically unjustifiable and an unnecessary barrier to access (Thompson, Raine, Foster, Speidel, Darney, Brindis, and Harper, 2013).

The authors of the official position statement of the Women's Health Practice and Research Network of The American College of Clinical Pharmacy argue that pharmacists have a duty to advocate for the patients' right to access emergency contraception and to facilitate access in their own pharmacies and beyond by ensuring timely access, lowering barriers to access, and educating their patients on proper emergency contraceptive use (Rafie, McIntosh, Gardner, Gawronski, Karaoui, Koepf, and Patel-Shori, 2013).

Barriers: Economic and Physical

No extensive analysis of the role of cost as an economic barrier to access to emergency contraception has yet been conducted. Though not specifically on emergency contraception, Foster and colleagues (2015) argue that cost may be the most important barrier to access to oral contraceptives in general. Econometric analysis correlating income level to likelihood of use of oral contraceptives in general led the researchers to

determine that, assuming no additional cost to the consumer, up to an additional 21% of women might use oral contraceptives. Depending on other factors, this would result in a 7% to 25% decrease in unwanted pregnancies. The authors find that providing low or no cost contraceptive coverage to low income women would radically lower healthcare costs (Foster, Biggs, Phillips, Grindlay, and Grossman, 2015). A similar argument would likely hold true for EC subsidization.

Studies of access to emergency contraception in urban areas have produced somewhat contradictory results. Bell, Camacho, and Velasquez (2014) intended to study availability of emergency contraception to men posing as mystery shoppers in various New York City neighborhoods. The study found the men were able to access EC 80% of the time and determined that economic barriers were the most significant impediments to access. The authors noted that pharmacies in lower socio-economic status neighborhoods had more restrictive hours and that the men had to travel to higher socio-economic status neighborhoods to access EC during those times, presenting a barrier to access. Legare and colleagues (2012) found no significant same-day availability of EC: 94 % available in East Harlem pharmacies and 93% on the Upper East Side. Given that average cost was \$45.16 in East Harlem and \$51.64 in Upper East Side pharmacies, the authors concluded these prices to be relatively low barriers to access (Legare, Bakshi, Keyhani, and Howell, 2012). These studies indicate that in urban areas, if a given pharmacy does not have same-day availability, a nearby pharmacy likely will. In urban areas, therefore, economic barriers may pose the greater relative barrier to access.

Other economic and physical barriers to access are likely in rural areas. Mackin and Clark (2011) studied availability of emergency contraception in Iowa pharmacies

before and after the 2006 FDA decision to make Plan B One-Step available without prescription. Though the number of pharmacies carrying Plan B increased from 57.8% to 70% following the change, the number of pharmacies reporting lack of demand as their reason for not carrying EC remained consistent: 67.5% before and 66.7 % after. This limitation to access is likely self-perpetuating. After moral objections, low demand was the primary reason cited by pharmacists who chose to not carry EC. Where EC is not regularly available, shoppers may be discouraged from requesting it, reinforcing the perception of lack of demand (Mackin and Clark, 2011).

Samson and colleagues (2013) conducted a survey designed to ascertain differences in availability at urban and rural pharmacies in Kansas. Researchers telephoned 201 pharmacies selected by random number generator. One hundred eighty-six pharmacists agreed to be interviewed. Pharmacists were asked if they carried EC and if it was currently in stock or available in 24 hours. Eighty-five percent of urban pharmacies could dispense EC within 24 hours while only 75% of rural pharmacies could. However, urban pharmacies were almost twice as likely to have EC in stock at the time of request. Further, urban pharmacies which were out of stock of EC were often corporate chain pharmacies which could direct patients to another branch nearby. The authors found that rural, independent pharmacies were least likely to carry EC, to have EC in current stock, or to be able to dispense EC within 24 hours (Samson, Loren, Downing, Schroepel, Kelly, and Ramaswamy, 2013).

Other researchers conducted a similar study in which secret shoppers called each of the 66 retail pharmacies in Wyoming. Gaffaney and colleagues (2015) asked a series of questions about EC location in the store, age and ID requirements, weight

appropriateness, and if the product was in stock. Since the survey was conducted after the June 2013 approval for OTC access without age restriction, complete accessibility was defined as in stock, on the shelf, and accessible without age or ID requirements. By these standards, only 10 of 63 pharmacies from which information was successfully gathered offered complete accessibility. Fifty-six pharmacies reported that emergency contraception was in stock. Thirty-six of the 63 pharmacies improperly imposed an ID requirement (Gaffaney, Stamm, Borgelt, Chau, Rupp, Blumhagen, and Gilroy, 2015). Given the recent change in regulatory status of EC products, it is difficult to determine whether and to what extent confusion or intent to avoid selling EC played a role in inaccessibility.

Many researchers have found that women in rural communities face significant physical barriers to EC access in the form of absence from store shelves and the added economic barrier of travel to another community to find the product in a timely manner (e.g., Mackin and Clark, 2011; Samson et al., 2013; and Gaffaney et al., 2015). In recognition of the fact of lower rural accessibility, Kelleher (2010) discusses the viability of a so-called moderate solution to pharmacist refusal to provide EC. The author examines the reasonability of allowing urban pharmacists to decline to provide EC given the supposed greater availability of EC in a given urban area. Kelleher rejected an urban-only pharmacy opt-out option, arguing that many of the same factors limiting access in rural communities may apply in low-income urban neighborhoods. Women in low socioeconomic status neighborhoods may lack the money or free time to travel to other neighborhoods and to require them to do so would represent an unjustifiable barrier to access (Kelleher, 2010).

Barriers: Pharmacy Staff's Lack of Knowledge

In an extensive study of emergency contraception access conducted in five American cities, Wilkinson and colleagues (2012) used secret shoppers to contact 943 pharmacies and had them present themselves as either as 17-year-olds requesting emergency contraception or as physicians requesting EC for their 17-year-old patients. Nineteen percent of pharmacies told “adolescent” callers it would be impossible for the pharmacy to dispense EC to them under any circumstances. Only 3% of physicians were told this. Only 57% of adolescents and 61% of physicians were told the correct age (at the time of the survey) for access to EC without prescription. That physicians were told incorrect data at a frequency near that for adolescents arguably indicates lack of knowledge more than intent to deceive (Wilkinson, Fahey, Shields, Suther, Cabral, and Silverstein, 2012). In a follow-up article to the same study, Wilkinson and other colleagues note that pharmacy staff often displayed confusion over EC regulations, imposed improper barriers to access, and were apparently unaware of their obligation to maintain confidentiality even for minor patients (Wilkinson, Vargas, Fahey, Suther, and Silverstein, 2015).

Researchers Young, Griffin, and Vest (2013) found that pharmacy students nearing completion of their degree are aware of their lack of knowledge of emergency contraception and that schools of pharmacy may not be adequately preparing new pharmacists for their responsibility to adolescent EC users. In a teaching exercise conducted at Midwestern University Chicago College of Pharmacy, two hundred third-year pharmacy students observed skits and were partnered with classmates for practice in emergency contraceptive counseling. Prior to the workshop, only 25% of the pharmacy students reported confidence in counseling patients on emergency contraceptive use.

Following participation in the exercise, 58.8% reported confidence in their counseling ability. The most commonly self-reported barrier to self-efficacy in counseling was lack of knowledge (Young, Griffin, and Vest, 2013).

Even in locales where most pharmacies were helpful and actively sought to make emergency contraception available, lack of knowledge remains a barrier to access for adolescents. Orr and colleagues (2015) describe data from telephone interactions in which female researchers posing as patients seeking EC called Rhode Island pharmacies in the spring of 2009 and again in spring of 2012. Ninety percent of pharmacies stocked EC each year. Notably, however, the number of pharmacies which provided the correct minimum legal age for purchase (prior to removal of that restriction in 2013) fell from 67% to 53%. The authors describe overall access to EC in Rhode Island as “very good” and determined the misunderstanding of the legal age for over-the-counter access to emergency contraception appears to be an honest mistake on the part of pharmacy staff (Orr, Lemay, Wojtusik, Opydo-Rossoni, and Cohen, 2015).

After age requirements, another common misunderstanding on the part of pharmacy staff is the belief that levonorgestrel and ulipristal act as abortifacients in a manner similar to mifepristone. Though ample literature to the contrary as discussed above is available, surveys of practicing pharmacists and other pharmacy staff find this belief to be relatively common. Mackin and Clark’s (2011) study of Iowa pharmacies before and after the 2006 FDA approval of over-the-counter access with age restrictions found that following that change, 38% of Iowa pharmacists still reported that they understood EC to function as an abortifacient.

Richman and colleagues (2012) considered responses to a 2008 survey of 1,264 randomly selected pharmacists registered with the Florida Board of Pharmacy. Though only 22% of selected pharmacists returned their unsolicited questionnaires and it is improper to consider this sample representative of Florida pharmacists overall, their responses nonetheless indicate the presence of significant barriers to EC access due to lack of knowledge. Forty-six percent of respondents answered in the affirmative that EC does induce abortion. Fifty-six percent of pharmacists responding reported that EC causes birth defects, again, contrary to the overwhelming evidence to the contrary. Only 22% of respondents correctly answered that EC could be purchased prior to need (Richman, Daley, Baldwin, Kromey, O'Rourke, and Perrin, 2012).

Gaffaney and colleagues (2015) reported that in their survey of Wyoming pharmacies conducted following the June 2013 removal of age and, therefore, identification requirements, 36 of the 63 pharmacies surveyed nonetheless improperly imposed an ID requirement. The authors also found that pharmacy staff at only 21 of the 63 pharmacies accurately communicated that emergency contraceptives are less effective in obese women (Gaffaney, Stamm, Borgelt, Chau, Rupp, Blumhagen & Gilroy, 2015).

Sixty-one percent of Florida pharmacists surveyed by Richman and colleagues (2012) expressed general “discomfort” with dispensing EC to adolescents. While personal beliefs likely account for an indeterminable portion of this discomfort, Mackin and colleagues (2011) found that while prior to 2006 43.8% of Iowa pharmacists understood EC to be safe for adolescents, that percentage fell to 27.9% following the change to over-the-counter status for Plan B. The thing that changed in that time was the ability of teens to purchase Plan B without medical examination or extensive advising as

to the proper use of the drug (Mackin, et al., 2011). Many pharmacists are apparently unaware of or doubt the studies showing the high degree of safety for levonorgestrel users or they doubt adolescents' ability to understand the drug's instructions and use it properly.

Two recent studies have shown such concerns to be unfounded and the source of unnecessary barriers to access. Manski and Kottke (2015) conducted a study of teen attitudes to EC as gathered from a survey conducted via advertisements on Facebook. Three hundred forty-eight females aged 14-17 years responded. Along with questions concerning their sexual activity and attitudes, respondents participated in a brief tutorial on key concepts necessary to understand for proper use of levonorgestrel. On average, participants were able to understand 7.1 of 8 concepts needed for proper EC use without further instruction (Manski and Kottke, 2015). Given that it would be reasonable to expect that many adolescent or adult users might not achieve a perfect score on such a quiz even if instructed by a doctor or pharmacist on proper use, it seems clear that the great majority of adolescents are able to understand how to take the single dose in a timely manner as instructed.

Raine and colleagues (2012) also examined the ability of adolescent females to safely and properly use EC. The study considered, adolescents aged 11-17 who requested EC at reproductive health centers in five U.S. cities were asked to read the product label and describe to healthcare providers how to use the product. The EC product was then dispensed to those patients who accurately understood the label instructions. Those patients were contacted one, four, and eight weeks later for follow-up interviews. Over nine in ten patients (91.5%) were able to understand the label and choose appropriately

whether to use the EC product or not. About ninety-three percent (92.9%) of participants used the product according to label instructions. Only 2.3% of participants who used the product became pregnant. No participants reported adverse side-effects (Raine, Ricciotti, Sokoloff, Brown, Hummel, and Harper, 2012). Again, these results would indicate that few proposed restrictions on use by adolescents are medically justifiable.

Barriers: Pharmacy Staff's Beliefs

As described above, the personal beliefs of parents and lawmakers have been primary factors in shaping public health policy on adolescent access to emergency contraception (Price, 2011; Thompson, et al., 2013). The beliefs of pharmacists and other pharmacy staff also play a highly significant role in the imposition of barriers to EC access. Many of the same studies that examine the role of lack of knowledge also contribute to a greater understanding of the role of the beliefs of pharmacy staff on adolescent access to emergency contraception. It appears that lack of scientific knowledge on EC often correlates to a reliance on personal belief on the part of pharmacy staff in making decisions concerning the dispensing of emergency contraception. For example, Wilkinson and colleagues (2014) found that the same pharmacy staffs that showed confusion and uncertainty as to emergency contraception regulations also resorted to ethical terms when describing their own pharmacy's policies on EC availability. Despite extensive evidence of the absence of abortifacient properties cited above, many pharmacists and other pharmacy workers believe use of or dispensing of levonorgestrel emergency contraceptives to be a form of abortion and therefore morally objectionable (Mackin and Clark, 2011; Richard, Kinzey, and Masters, 2015). Many pharmacists also persist in the belief, shown to be false by Raine and colleagues (2012)

and by Manski and Kottke (2015) that levonorgestrel is unsafe for adolescents without medical and adult supervision.

As discussed above, Mackin and Clark (2011) found that 38% of pharmacists in Iowa at the time they were surveyed believed Plan B to function as an abortifacient. Likewise, Richman, et al. (2012) found that 46% of pharmacists responding to the survey believed Plan B induces abortion. In both cases, it is difficult to know where misunderstanding of chemical mechanism of levonorgestrel ends and personal beliefs concerning abortion begin. However, neither study asked pharmacists both what they understood about the chemical function of emergency contraception and their personal beliefs concerning abortion.

An extensive recent study of pharmacist beliefs concerning the dispensing of hormonal contraceptives in general was conducted in the rural town of Winchester, Virginia. Richard, Kinzey, and Masters (2015) sent surveys to each of the town's 52 pharmacists, who work in 32 pharmacies, in March of 2011. The survey had a 63% response rate. The survey questioned attitudes toward hormonal contraceptives generally, but not EC specifically. Fifty-four percent of responding pharmacists opposed prescription of hormonal contraception by pharmacists. Ninety-five percent opposed over-the-counter access to any hormonal contraceptives and 71% did not even support behind-the-counter access. Eighty percent of pharmacists responding doubted their patients' ability to self-screen for contraindications (Richard, Kinzey, and Masters, 2015). This opposition on the part of Winchester, Virginia's pharmacists is in extreme contrast to the relative ease of access observed by Orr and colleagues (2015) in their survey of Rhode Island pharmacies or by Legare and colleagues (2012) in their study of New York

City pharmacies. These findings strongly indicate that in many rural communities there may be very little advocacy for expanded access to contraceptives of any kind on the part of pharmacists, let alone support for greater access to emergency contraceptives.

Need for Further Study and Public Health Interventions

Writing prior to the 2013 expansion of availability, Devine (2012) seeks to explain the failure of EC to lower the rate of unintended pregnancy despite prescription availability for three decades and over-the-counter availability since 2006. The author attributes this lack of effectiveness to a combination of lack of awareness of the nature of EC and its over-the-counter status, the incorrect belief that EC is an abortifacient, privacy concerns, and concerns over adverse health effects. Further study will be necessary to determine if the 2013 expansion of access contributed to greater utilization of EC.

Baird and colleagues (2015) also discuss the failure of greater EC availability to lower the rate of unintended pregnancy. The authors note that all approved forms of emergency contraceptives are less effective than regular use of any other physical or hormonal contraceptives available. Along with the need for greater public awareness of and access to emergency contraception, the authors advocate public health interventions aimed at ensuring that women who use EC will transition successfully afterwards to regular, more effective birth control methods and to prevent overreliance on EC as a birth control method (Baird, Cameron, Evers, Gemzell-Danielsson, Glasier, Moreau, and Volpe, 2015).

Melton, Stanford, and Dewitt (2012) specifically studied the potential problem of overreliance on EC as a primary form of contraceptive. The authors are concerned that many women in a Utah survey of emergency contraception use reported using EC more

than once in the previous year. Echoing other researchers' concerns that women should be encouraged to begin a regular contraceptive method following EC use, the authors warn against the alternative of accidentally instilling an overly high estimation of the efficacy of EC. Levonorgestrel pills were believed to be about 77% effective as of the most recent data available at the time of the survey. Of the women surveyed, 58% believed Plan B to be 90% effective and 16% reported belief that it is nearly 100% effective. The authors assert that women who repeatedly use EC successfully likely overestimate its effectiveness (Melton, Stanford, and Dewitt, 2012). Efforts to increase access should be wary of inducing dependence on EC as more than a backup method of contraception.

Researchers have also studied the possibility that increased availability of EC in pharmacies may result in fewer sexual assault victims seeing help in emergency rooms. Gross, Lafortune, and Low (2014) speculate that this would lead to a lower rate of reporting of sexual assaults and prevent timely collection of physical evidence of assault. The authors do not assert that they have conclusively proven this hypothesis and research is ongoing, but they highlight the need for pharmacists and public health professionals to consider this possibility when implementing any plan to increase accessibility of EC.

Durrance (2013), writing in *Economic Inquiry* considered a possible correlation between trends in sexually transmitted infections and the increased access to EC. Acting to increase access to emergency contraception many years before over-the-counter status was approved by the FDA in 2006, Washington State officials allowed pharmacists to begin prescribing EC in 1998. Following that change, rates of gonorrhea infections both in women and in men rose in significant correlation to the increase in EC availability at

the county level. The author has been unable to discount this correlation with falsification tests. It may be that pharmacies were simply more likely to provide greater EC access in counties that were already trending toward more unsafe sexual contact in response to that need; an upward trend in unsafe sex would explain both greater need for EC and a rise in STD infections. In any case, any such trend requires explanation.

In a recent broader study, Atkins and Bradford (2015) also considered the possibility that greater access to emergency contraception could lead to greater sexual risk taking by women. Their data set was collected for the National Longitudinal Survey of Youth from October 1999 through November 2009 on 3,786 women age 18 and over. This provided data from years before and after the 2006 FDA decision to allow states to permit pharmacies to provide EC over-the-counter, without prescription. The data set also included women in states with and without over-the-counter EC. The authors were able to consider variables including frequency of sexual activity, number of partners, condom use, etc. The researchers found no relationship between the 2006 national policy change and probability of sexual activity, likelihood of unprotected sexual activity, or number of sexual partnerships (Atkins and Bradford, 2015). Women in the states which chose to make EC available without prescription did report greater likelihood of unprotected sex, though this may correlate to the variance in sexual mores by state or with the passage of time rather than indicate a causal relationship to the change in EC availability.

Several researchers have recognized and studied the role of sexual partners and other allies in accessing emergency contraception. Bell, Camacho, and Velásquez, (2014) sent male mystery shoppers into pharmacies in three New York City neighborhoods to request EC. While almost three-quarters of pharmacies (73.3%) were considered by the

authors to have presented some barriers to EC access, the most common barriers to access were found to be limited hours in lower socio-economic status neighborhoods and higher cost in higher socio-economic status neighborhoods. Despite various barriers, the male mystery shoppers in the study were able to access EC 80% of the time (Bell, Camacho, and Velásquez, 2014).

Schrager and colleagues (2014) reported the findings of surveys of 198 new patients at two Los Angeles primary care clinics on their past use of, knowledge of, and attitudes toward emergency contraception. Only about half of women and one third of men knew EC was available without prescription. Only 24% knew that males could purchase EC for partners (Schrager, Olson, Beharry, Belzer, Goldsich, Desai, and Clark, 2014). These studies indicate that greater public health education efforts aimed at men and at informing women that their male partners can help them obtain EC in a timely manner.

Through a qualitative study of the experiences of adolescent females in accessing EC, Fallon (2010) explores how teens have relied on peers to deal with shame and barriers to access of EC. The girls interviewed described their efforts in helping each other to obtain EC confidentially and understand how to use the product properly. Fallon (2010) finds that teens can assume supporting roles and shed labels associated with underage sexual activity in favor of self-efficacy in the face of opposition to their access to contraceptives. These findings have important implications for efforts to educate minors about the use of and access to EC. While adolescent peers may not be ideal reproductive care advocates, health professionals should realize that teens will likely turn

to their peers for support. Public health education interventions should be designed with such considerations in mind.

Several studies have found evidence of a general lack of knowledge as to the nature of and availability of emergency contraception among female adolescents, women in general, and the public overall. Yen and colleagues (2015) reported the results of anonymous surveys of 439 uninsured young people aged 13 to 25 using the services of mobile primary care provider in the San Francisco, California Bay Area from 2010 to 2012. The mean age of the respondents was 17.8 years and 66% of respondents were women. Eighty-six percent of young women reported having heard of EC, but most respondents had many misunderstandings about the nature of EC. Forty percent of respondents incorrectly believed emergency contraception induced abortion. Forty-four percent incorrectly believed EC had to be taken within 24 hours of intercourse. Only 40% of the young women were aware that EC was available without prescription. Additionally, 72% did not know that males could purchase EC for their partners (Yen, Parmar, Lin, and Ammerman, 2015). In a similar study of 226 young females aged 14-19 years old presenting for treatment at two urban emergency departments Mollen and colleagues (2013) likewise found significant lack of knowledge of the safety and availability of EC. The majority of the teens surveyed expressed concern about long-term (78% of respondents) and short-term (86%) adverse side-effects. Forty-five percent believed they needed a prescription and doubted they would be able to get one quickly (Mollen, Miller, Hayes, and Barg, 2013).

The above information demonstrates that a need exists for public health interventions to educate young women, pharmacy staff, and indeed the general public

about the use, efficacy, and availability of emergency contraceptives. Several interventions have in fact been completed in pharmacy settings which have been shown to significantly increase patients' and pharmacy staffs' knowledge and reduce barriers to EC access. Ragland, Payakachat, and Stafford (2015) describe the results of an intervention conducted in a retail pharmacy setting over the course of two months in 2012. Pharmacy students counseled female participants for ten minutes on the basics of use of and access to EC. Participants were tested before counseling to establish what the women already knew and were tested again following counseling. The women were also contacted by telephone 1 to 3 months later for a follow-up test. Tests immediately after counseling showed significant increase in understanding of EC. The follow-up tests also showed significantly higher scores (Ragland, Payakachat, and Stafford, 2015). These results show that minimal time spent educating patients in a pharmacy setting can lead to an immediate and long-lasting increase in understanding of EC related information. Batra, Aquilino, and Farris (2015) evaluated pharmacy staff survey results following a two year intervention designed to reduce unplanned pregnancy in women aged 18 to 30 in 12 Iowa counties. The staff had all participated in online education and campaign materials such as posters and brochures were available in the 55 pharmacies included in the intervention. Though the study did not focus on emergency contraception, the authors significantly found that 90% of participating staff found discussing contraceptive use with patients easy after the intervention and expressed a desire to prioritize the topic (Batra, Aquilino, and Farris, 2015). That the Iowa pharmacy staff became more open to discussing contraception in general does not necessarily imply an increased desire to provide EC. This emphasizes the need for the integration of EC specific education into

any intervention designed to improve pharmacy staff dialog with women on contraceptives in general.

Finally, Young, Griffin, and Vest (2013) described the results of a teaching exercise conducted at Midwestern University Chicago College of Pharmacy. Two hundred third-year pharmacy students observed skits and were partnered with classmates for practice in emergency contraceptive counseling. Prior to the workshop, only 25% of the pharmacy students reported confidence in counseling patients on emergency contraceptive use. Following participation in the exercise, 58.8% reported confidence in their counseling ability. The most commonly self-reported barrier to self-efficacy in counseling was lack of knowledge (Young, Griffin, and Vest, 2013). The results of this workshop indicate that significant gains in EC counseling skills pharmacists can be achieved with minimal additional instruction and practice. Though the practice partners were adult pharmacy students, the workshop results indicate that education and practice in counseling minors could produce equal or greater increases in pharmacists' knowledge and comfort with counseling adolescents on EC use.

The relevant literature affirms the safety of levonorgestrel EC products and describes the social rather than scientific basis of opposition to greater access to Emergency Contraception and the resulting barriers. Much of the relevant literature is designed to explore and understand those barriers, but this research is limited in scope. Specifically, the only studies conducted in the southern United States have been surveys of pharmacists in Florida and in Winchester, Virginia. While more extensive statewide studies have been conducted in Iowa, Kansas, Rhode Island, and Wyoming, barriers to EC in these states may not be representative of barriers to EC access elsewhere. These

studies do, however, demonstrate the feasibility of collecting valuable data on barriers to EC, specifically via “secret shopper” interviews. The opportunity to expand the literature to include a study of over-the-counter EC access in Kentucky and to improve upon both the selection of questions to be asked and the analysis of the data collected provides a strong rationale for the study.

Chapter 3

METHODOLOGY

This study simulated the experience of an adolescent female seeking access to over-the-counter emergency birth control in Kentucky pharmacies. A cross-sectional, mixed-methods study was developed to gather descriptive information and data that can yield answers to the following research questions:

1. Are there differences in/associations between affordability, physical accessibility, pharmacy staff knowledge and pharmacy staff attitudes based on whether a pharmacy is rural or urban?
2. Are there differences in/associations between affordability, physical accessibility, pharmacy staff knowledge and pharmacy staff attitudes based on whether a pharmacy is chain or privately owned?
3. Do factors such as whether a pharmacy is chain or privately operated or whether it is urban or rural predict a pharmacy's likelihood of carrying EC?
4. Do factors such as whether a pharmacy is chain or privately operated or whether it is urban or rural predict the level of EC knowledge among pharmacy staff?
5. Do factors such as whether a pharmacy is chain or privately operated or whether it is urban or rural predict the level of negative attitudes demonstrated by pharmacy staff?

Study Design and Justification

Data collection began in July 2016, after receiving approval from Western Kentucky University's Institutional Review Board. The researcher telephoned selected Kentucky pharmacies in the sample areas posing as a potential customer, known as a "secret shopper" study when used in market research. The caller presented herself as a 15-year-old female who had unprotected sex two days prior to the phone call and needed more information on the product. The age was chosen based on the 2013 change to the law that allows anyone to purchase EC over the counter without a prescription rather than restricting purchase to people aged 17 years and older. The caller followed a semi-structured script designed to assess pharmacy staff knowledge of levonorgestrel (effectiveness, function, etc.), knowledge of the legal status of levonorgestrel, and financial and physical accessibility.

Although the "secret shopper" design involved a level of deception, this research approach has been used successfully in previous studies assessing adolescent access to over-the-counter emergency contraception. In an extensive study of emergency contraceptive access conducted in five American cities, Wilkinson, Fahey, Shields, Suther, Cabral, and Silverstein (2012) used secret shoppers to contact 943 pharmacies by phone and had them pose either as 17-year-olds requesting emergency contraception or as physicians requesting EC for their 17-year-old patients. In another study, Orr, Lemay, Wojtusik, Opydo-Rossoni, and Cohen (2015) collected aggregate data from telephone interactions in which female researchers posing as patients seeking EC called Rhode Island pharmacies in the spring of 2009 and again in spring of 2012. In order to determine if a girl's sexual partner or male family member would experience difficulties obtaining emergency contraception, Bell, Camacho, and Velásquez, (2014) sent male

mystery shoppers into pharmacies in three New York City neighborhoods to understand their experience. The design of this research was based on previously-established ‘secret shopper’ study designs such as those mentioned above.

Each pharmacy was contacted one time via telephone. If the call was answered, this met the criteria for having made ‘contact,’ and the pharmacy would not be telephoned again regardless of whether or not any useful information was obtained. If the call was left unanswered, the pharmacy would be highlighted in the sampling frame to receive a call at another time. Phone calls were made from a quiet, private room in the researcher’s home on weekdays between the hours of 8am and 6pm since these are the typical pharmacy operating hours. The researcher, presenting herself as a 15-year-old girl, followed the semi-structured script with whomever first answered the phone. While the caller never requested a transfer to the pharmacist, often the original respondent would transfer anyway. If the original call was transferred to a second person (for example, if a pharmacy technician transferred the call to a pharmacist), the caller would continue the interview with the second person and record the job title of the highest-ranking person interviewed.

Sample and Sampling Frame

Kentucky is divided into five regions: The Jackson Purchase, the Western Coal Fields, the Bluegrass Region, the Mississippi Plateau, and the Cumberland Plateau (Clotter, 2000). Using a purposive sampling technique to determine which counties to request for inclusion in the sampling frame, the counties included were from each of the major Kentucky regions as well as urban, rural non-Appalachian, and Appalachian areas. The rural sampling frame consisted of 7 counties randomly selected from the Jackson

Purchase, Mississippi Plateau, and Western Coal Fields regions (mostly rural regions). The Appalachian sampling frame consisted of all listed pharmacies from 7 counties randomly selected from the Cumberland Plateau region. The rurality of the selected counties was verified using county demographic information available on the County Health Rankings and Roadmaps website (University of Wisconsin Population Health Institute, 2016). If a county was over 33% rural, it qualified for inclusion. Every operating pharmacy in the rural and Appalachian counties included in the sampling frame was contacted (n=95). The urban sample consisted of pharmacies randomly selected from within the three largest urban areas in Kentucky: Louisville, Lexington, and Bowling Green (n=125).

A list of licensed pharmacies in the selected counties and cities was obtained through the Kentucky State Board of Pharmacies. After removing hospital and specialty pharmacies, the list included 329 qualifying pharmacies. In total, 67% of all the pharmacies listed in the sampling frame were contacted (n=220). However, only those pharmacies that regularly stocked EC and had it available at the time of the call completed a full interview (n=103).

Confidentiality

This study involved an analysis of aggregated data. Confidentiality was maintained by not collecting the name of the person being interviewed or any other identifying details. Further, while the address and name of the pharmacy were included in the sampling frame, this information was not included in the final dataset. Pharmacies were labeled as either rural (non-Appalachian), urban, or Appalachian and as either chain or non-chain pharmacies. Pharmacies were not labeled by county or specific city. This

non-specific labeling method allowed the researcher to answer the given research questions while protecting the pharmacies sampled.

Call Scripts and Data Collection

The semi-structured interview script was designed to determine the physical availability of EC in the pharmacy as well as the pharmacy staff's understanding about proper usage and legal requirements to obtain the drug. The script contained the following questions:

1. Hi. I need to ask about something personal...you're an adult...like over 18, right? (This question was asked to prompt the respondent to confirm that they are "over 18" or are presently 18 years of age, or are under 18 years of age, while realistically sounding like the phrasing a 15-year-old would plausibly use.)
2. Do you carry the morning after pill? (If no: Can you recommend a pharmacy that would have it?)
3. Can I get it now?
4. Do I need a prescription?
5. Well, I am 15, so do I need to bring my mom or something?
6. How long after sex before it doesn't work anymore? (Recorded in hours)
7. Will it work for sure?
8. Is it the same like going and getting an abortion?

9. Where can I find it in the store? (Asked to determine if it is available on an aisle [customer does not have to interact with pharmacy staff], behind the pharmacy counter [customer must interact with staff to obtain EC], or other)

10. How much does it cost? (Recorded cheapest option)

11. So are you the pharmacist or a tech or...? (Asked to determine the job of the person interviewed)

After the person on the phone confirmed that they were 18 or older, the rest of the interview continued as outlined in the flow chart included in Appendix I. The structured interviews were pilot tested by calling pharmacies outside of Kentucky and, therefore, outside the sampling frame. Data was hand-recorded on standardized forms and coded in an Excel document. The Excel data was later imported into SPSS version 24 for analysis.

Measures

Characteristics of Pharmacy and Respondents

The following four measures describe both the pharmacies and respondents generally. These include whether the pharmacy is rural or urban; whether it is a chain or private pharmacy; the perceived gender of the respondent; and the respondent's reported job title. Detailed descriptions of these measures are listed below.

1. Urban/Rural/ Appalachian

As outlined above, pharmacies were designated as either rural, urban, or Appalachian in the dataset. Urban was coded as "1"; rural was coded as "2" and Appalachian was coded as "3" in the final SPSS dataset. Because of the similarities between the rural and Appalachian samples, this variable was also recoded into

Urban/Non-Urban where the pharmacies from Louisville, Lexington and Bowling Green were coded as “2” and labeled “Urban” and the pharmacies in the Appalachian and Rural samples were combined and coded as “1” for “Non-Urban”.

2. Chain or private

Each pharmacy contacted is classified a chain pharmacy (e.g., Walgreens, CVS) or as a private pharmacy as reflected in the sampling frame of Kentucky pharmacies provided by the Kentucky Board of Pharmacy. In the dataset, chain pharmacies are coded as “1” and private pharmacies are coded as “2”.

3. Perceived Gender

This measure noted the gender of the person interviewed at the pharmacy as subjectively perceived by the caller. The caller was prepared to list each individual answering the call as male, female, or indeterminate. However, all pharmacy employees were subjectively perceived to be either very likely male (coded “1”) or very likely female (coded “0”).

4. Reported Job Title

Near the end of each interview, if the interviewee had not already offered their job title or otherwise been clearly identified as the pharmacist, etc., the caller asked some version of the question, “So are you the pharmacist?” Upon being asked this or with a simple continuation of the question, almost all of the interviewees would readily offer their job title. Interviewees were categorized as PHARMACIST, PHARM TECH, PHARMACY INTERN, or CASHIER. Only 5 interviewees identified as anything other

than a pharmacist or pharmacy technician, so these five were labeled “OTHER” and coded as missing in the analysis.

Physical and Economic Accessibility of EC

The five measures included in this category describe the physical availability of emergency contraception at the pharmacy as well as the cost. These include whether the pharmacy carries EC; whether the respondent recommended another pharmacy if they did not carry EC; whether or not they had EC in stock; the product’s location in the store and the cost of the product.

1. Pharmacy Carries EC

The caller asked in each interview, “Do you carry the morning after pill?” Any answer indicating that the pharmacy usually stocked Plan B or any other generic oral Emergency Contraceptive was classified as a YES (coded “1”; NO coded “0”) even if the pharmacy was out of stock at the time of the call.

2. If No, Recommends Other Pharmacy

The caller asked “Do you know where I can get it?” This measure was recorded as a YES (coded “1”; NO coded “0”) only if the pharmacy employee directed the caller one or more other specific pharmacy by name as a likely source of EC.

3. Has in Stock Presently

If told that the pharmacy did carry “the morning after pill,” the caller next asked, “Can I get it right now?” to determine that the pharmacy both normally stocked EC and had it in stock at the time of the call. YES was coded 1 and NO was coded 0.

4. Location within Store

In each interview the caller asked where in the store the product was located. Answers such as “behind the counter,” or “here in the pharmacy,” were coded as BEHIND THE PHARMACY COUNTER (Coded “1”). If the pharmacy employee stated that the EC was in a locked case this was recorded as LOCKED ON SALES FLOOR (coded “2”). If the product was stated to be “in the store,” “over the counter,” on a given aisle or in a given department, but not noted to be in a locked case this was coded as SALES FLOOR (coded “3”).

5. Cost of EC

The caller asked each respondent for the price of the EC product available at the time of the call. The given dollar amount was recorded as stated. If the respondent gave the prices of several options, the dollar amount of the cheapest product was recorded.

Pharmacy Staff Knowledge of EC

To determine the likelihood of an adolescent receiving accurate answers to questions about emergency contraception, five knowledge-based questions were asked during each interview. These questions assessed if a pharmacy staff member knew whether or not a prescription was required for purchase; if the caller needed to bring an adult to purchase the product; if they knew the timeframe for efficacy of EC; if they knew how effective EC is for preventing pregnancy; and whether EC is an abortifacient. If the staff member voluntarily stated the percentage of efficacy they believed to be correct, that was recorded as well. Also, an overall knowledge scale was developed and included in this measurement category.

1. Requires Prescription

The caller asked “Do I need a prescription?” YES (coded “1”; NO coded “0”) is recorded for this measure if the pharmacy employee indicated that a prescription was required for any purchase of EC or if the employee initially indicated that no prescription was required but amended that answer upon hearing that the caller is 15.

This variable was recoded into a variable that indicated whether the employee’s response was correct (consistent with the literature and current laws) or incorrect. Incorrect answers included all answers that indicated the caller needed a prescription and any uncertain answers. Incorrect answers were coded “0” and correct answers were coded “1”.

2. Requires Adult to Purchase

The caller would state in each interview that she was 15 and ask “so do I need to bring my mom or someone...older?” Any answer indicating that the caller must, should, or “would probably need to” bring a parent or at least an adult age 18 was recorded as a YES (coded “1”; NO coded “0”).

This variable was recoded into a variable that indicated whether the employee’s response was correct (consistent with the literature and current laws) or incorrect. Incorrect answers included all answers that indicated the caller needed to bring an adult and any uncertain answers. Incorrect answers were coded “0” and correct answers were coded “1”.

3. Stated efficacy timeframe (in hours)

The caller asked “How long after sex does it work?” Most pharmacy staff answered in a number of hours; most commonly 24, 48, or 72. Any specific number of

hours was recorded. If the pharmacy employee answered a range (e.g., “24 to 48 hours”) the higher number was recorded. If the answer was unclear or the pharmacy employee declined to provide an answer, it was coded as “99” in the dataset and excluded from final analysis.

This variable was recoded into a variable that indicated whether the employee’s response was correct (consistent with the literature and current laws) or incorrect. Incorrect answers included all answers that underestimated or overestimated the efficacy timeframe (more or less than 72 hours after unprotected sex) as well as any uncertain answers. Incorrect answers were coded “0” and correct answers were coded “1”.

4. Perceived Assurance of Efficacy

This measure reflected the answers to the caller’s question “Will it work for sure?” The answers varied widely and were assigned as affirming a very high likelihood of preventing pregnancy YES (coded “1”) if the pharmacy employee offered such answers as, “yes,” “definitely,” “absolutely,” “it’s really effective,” “it’s really good,” etc., or if the pharmacy employee offered a percent chance of preventing pregnancy of 95% or higher. Numerical answers lower than 95% or such as “no,” “nothing’s guaranteed,” “it’s not 100%”, etc. were coded as NO (coded “0”).

This variable was recoded into a variable that indicated whether the employee’s response was correct (consistent with the literature) or incorrect. Incorrect answers included all answers that indicated certainty/near certainty of preventing pregnancy and any answers that indicated the employee did not know the efficacy (e.g., “I don’t know”

or “I’m not sure”). Incorrect answers were coded “0” and correct answers were coded “1”.

5. *Believed % Efficacy if Stated*

Pharmacy staff members were never asked to provide a percent chance of EC preventing pregnancy, but many offered a percent chance as part of their answer to the question, “Will it work for sure?” Additionally, if the caller were told that the EC would “absolutely” or “definitely” work, this was recorded as an answer of 100%, since assigning this numerical value would not require subjective evaluation. Any 15-year-old caller would reasonably believe such unequivocal terms to mean that EC is literally 100% effective.

6. *Stated EC is abortion*

Each interview included the question, “So is it the same like going and getting an abortion?” Answers were coded as NO (coded “0”), YES (coded “1”), or UNCLEAR. The answers “no,” “it’s not like that,” “I don’t think so,” etc. were coded as NO. Answers such as “yes,” “I would say so,” or “anytime you interfere with the pregnancy that’s basically an abortion,” were coded as YES. All others were coded as UNCLEAR, including declining to answer. Unclear answers were coded as missing and removed from analysis.

This variable was recoded into a variable that indicated whether the employee’s response was correct (consistent with the literature) or incorrect. Incorrect answers included all answers that indicated emergency contraception is an abortifacient as well as

any unclear or unsure answers. Incorrect answers were coded “0” and correct answers were coded “1”.

7. Overall Knowledge Scale

As previously stated, the answers to the following questions were recoded to indicate whether an interviewee’s responses were correct or incorrect:

1. Do I need a prescription?
2. Do I need to bring my mom or someone older?
3. How long after sex does it work?
4. Will it work for sure?
5. Is it the same like going and having an abortion?

Each correct answer was coded as “1” and each incorrect answer was coded as “0”. An overall correct answer scale was created by summing these variables. The scale ranged from 0-5, with higher scores indicating a greater number of correct responses.

Attitudes of Pharmacy Staff as Perceived by Caller

These measures are subjective scorings of the attitudes of the person interviewed. The caller ranked each final interviewee on intended helpfulness, apparent discomfort, and perceptibly judgmental attitude. Unhelpfulness is ranked on a scale of 1 through 5, with 1 being very helpful and 5 being very unhelpful. Incorrect information is not held against the interviewee in this measure, as it is strictly a measure of their apparent intent to provide assistance to the caller. Apparent discomfort was measured on a scale of 1 through 5, with 1 indicating no discomfort and 5 indicating extreme discomfort.

Recognized indicators of discomfort included offering equivocal answers, declining to answer, taking a long time to answer, etc. Perceived judgmental attitude was measured on a scale of 1 through 5, with 1 representing no perceptible judgmental attitude and 5 representing an extremely judgmental attitude. Indicators of a perceptibly judgmental attitude included audible exclamations, assuming an angry tone of voice, or hanging up on the caller after hearing her age or when asked questions about abortion. These three measures were summed and averaged to create a 5-point overall negative attitude scale which was found to have good internal consistency ($\alpha=.83$).

Chapter 4

RESULTS

Descriptive Results

To understand the accessibility of emergency contraception in Kentucky generally, frequencies and percentages of the variables were obtained using SPSS version 24. The descriptive results of the sample are detailed below.

Characteristics of Pharmacy and Respondents

Over half (57%) of the pharmacies included in the study were urban while 43% were rural. Chain pharmacies made up 49% of the sample, while private pharmacies accounted for 51% of the sample. Of those who were interviewed, 76% were perceived to be female while just 24% were perceived as male. When asked their job titles, 51% of those interviewed identified themselves as pharmacists, 44% said they were pharmacy technicians, and 5% reported some other job title. Results are displayed in Table 1.

Table 1: Descriptive Characteristics of Pharmacies and Respondents

	<i><u>Frequency</u></i>	<i><u>%</u></i>
<i>Urban/Non-Urban (n=220)</i>		
Urban	125	56.8
Non-Urban	95	43.2
<i>Chain/Private (n=220)</i>		
Chain	108	49.1
Private	112	50.9
<i>Perceived Gender (n=220)</i>		
Female	167	75.9
Male	53	24.1
<i>Reported Job Title (N=103)</i>		
Pharmacist	53	51.46
Pharm Tech	45	43.69
Other	5	4.85

Physical and Economic Accessibility of Emergency Contraception

Of the pharmacies called, just over half regularly carried emergency contraception (51%). Of those respondents from the 49% of pharmacies that did not carry EC, 61%

were able to recommend another pharmacy that carried EC. Of those that carried EC, 93% had it in stock at the time of the call. The average cost of EC at these pharmacies was \$42.69 (SD= \$8.39). About half (51%) of the pharmacies responded that EC was available at that time on their sales floor. Over a quarter (28%) reported that EC was located either behind the pharmacy counter or locked on the sales floor. Results are reported in Table 4 below.

Table 2: Descriptive Information of Physical and Economic Accessibility to Over-the-Counter Emergency Contraception

		<u>Frequency</u>	<u>%</u>		
Pharmacy Carries EC (N=220)					
	Yes	111	50.5		
	No	109	49.5		
Recommends other Pharm if no (N=110)					
	Yes	69	62.7		
	No	41	37.3		
In Stock Today (N=111)					
	Yes	103	92.8		
	No	8	7.2		
Location in the Store (N=103)					
	Behind Pharmacy Counter	18	17.48		
	Locked on Sales Floor	11	10.68		
	On Sales Floor	53	51.46		
	No Answer/Not Sure	21	20.38		
		<u>Mean</u>	<u>SD</u>	<u>Min</u>	<u>Max</u>
Reported Cost of EC (N=103)					
	Cost	\$42.69	\$8.39	\$24.00	\$70.00

Pharmacy Staff Knowledge of Emergency Contraception

Most (95%) of the respondents correctly stated that EC was available without a prescription. Although 62% of the respondents correctly stated that the 15-year-old caller did not need an adult to purchase EC, 39% responded to this question incorrectly. Over a quarter (28%) of respondents did not give the correct answer to the question “how long after sex does it work?” Most (55%) of respondents over-estimated how effective EC is

for preventing pregnancy. Around one-in-five of those called (22%) either reported that using EC is the same as having an abortion or indicated they were unsure. The average score on the Overall Knowledge Scale was 3.4 (SD= 1.19) with a minimum score of 0 (all answers incorrect) and a maximum score of 5 (all answers correct). Results are displayed in Table 3 below.

Table 3: Descriptive Information of Pharmacy Staff Knowledge about Over-the-Counter Emergency Contraception

	<i>Frequency</i>	<i>%</i>		
<i>Need Prescription (N=103)</i>				
Yes	5	4.9		
No	98	95.1		
<i>Need Adult to Purchase (N=103)</i>				
Yes	38	36.9		
No	63	61.7		
Don't Know/ Not Sure	2	1.9		
<i>Correct Answer: Efficacy Timeframe (N=103)</i>				
Correct	74	71.84		
Incorrect	29	28.16		
<i>Correct Answer: Efficacy Assurance (N=77)</i>				
Correct	35	45.5		
Incorrect	42	54.5		
<i>EC is the same as Having Abortion (N=102)</i>				
Yes	19	18.6		
No	80	78.4		
Unknown/Unsure	3	2.9		
	<i>Mean</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
<i>Overall EC Knowledge (N=103)</i>				
Increases= More correct answers	3.40	1.19	0	5

Perceived Attitudes of Pharmacy Staff

The measure of perceived unhelpfulness ranged from 1 to 5 with higher scores indicating greater unhelpfulness. The mean score on this measure was 2.38 (SD=1.31) with a minimum score of 1 and maximum score of 5. The perceived discomfort measure also ranged from 1 to 5 with increases indicating greater discomfort. The mean discomfort score was 1.17 (SD=1.19) with a minimum score of 1 and maximum score of 4. The perceived judgmental attitude measure again included ratings ranging from 1 to 5.

The mean value for this measure was 1.67 (SD=1.12) with a minimum score of 1 and a maximum score of 4. After the previous three measures were summed and averaged to create a 5-point overall negative attitude scale, the mean value was 1.67 (SD= 1.12) with a minimum score of 1 and a maximum of 4. Results are displayed in Table 4 below.

Table 4: Descriptive Information Perceived Attitudes of Pharmacy Staff

	<u>Mean</u>	<u>SD</u>	<u>Min</u>	<u>Max</u>
<i>Perceived Unhelpfulness (N=103)</i>				
<i>Increases= Increasingly Unhelpful</i>	2.38	1.31	1	5
<i>Perceived Discomfort (N=103)</i>				
<i>Increases= Increasingly Uncomfortable</i>	1.17	1.19	1	4
<i>Perceived Judgmental (N=103)</i>				
<i>Increases= Increasingly Judgmental</i>	1.67	1.12	1	4
<i>Perceived Negative Attitude (N=103)</i>				
<i>Increases= Increasingly Negative Attitude</i>	1.92	1.04	1	5

Inferential Results

To explore the data for any relevant differences in affordability, in physical accessibility, in pharmacy staff knowledge, and in pharmacy staff attitudes based on whether a pharmacy was chain or private and whether a pharmacy was rural or urban, chi-square and independent sample T-test analyses have been conducted using SPSS version 24. Similar analyses were conducted to test if there were differences in all the dependent variables based on whether the respondent was a pharmacist or pharmacy technician. After this, four regression models were conducted to test specific hypotheses. A sequential logistic regression analysis was conducted to determine if availability of EC could be predicted based on whether the pharmacy was rural or urban or if it was chain or private. An additional logistic regression analysis was conducted to determine if the likelihood of a pharmacy being chain or private could be predicted based on whether it is in a rural or urban setting. Then, two sequential linear regression analyses were

conducted to determine if chain/private or rural/urban pharmacy statuses were significant predictors of pharmacy staff knowledge about emergency contraception and perceived negative attitude towards the conversation.

Associations/Differences between Rural and Urban Pharmacies

Chain pharmacies were more likely to be found in urban areas ($\chi^2= 23.06$; $p=.000$). Around 63% of urban pharmacies were chain pharmacies while just 30% of the rural pharmacies were pharmacy chains. Also significantly associated was the likelihood of a pharmacy carrying EC; 61% of urban pharmacies carried EC while just 37% of rural pharmacies carried it ($\chi^2= 12.36$; $p=.000$). While only 1.4% of urban pharmacy staff members said that a 15-year-old would need a prescription to purchase EC, 13% of rural respondents reported that a prescription was necessary ($\chi^2= 6.22$; $p=.013$). Urban pharmacy staff members were more likely to correctly know how long after sex EC remained effective when compared to rural staff; 82% of urban respondents answered this correctly while 63% of rural respondents gave a correct answer ($\chi^2= 4.030$; $p=.045$). Similarly, urban pharmacy staff members were more likely to answer correctly when asked “is this the same as going and having an abortion?” Of the rural respondents, 64% answered this question correctly, while 93% of urban pharmacy staff responded correctly ($\chi^2= 11.85$; $p=.001$). The difference in overall EC knowledge between rural and urban pharmacies was significantly different ($t= 3.07$; $p=.001$). On average, urban staff scored 3.63 (SD=.956) on the 5-point knowledge scale. Rural staff scored 2.87 (SD=1.50) on average. There was also a significant difference in overall negative attitude between these two groups ($t= 3.53$; $p=.008$). The average score in perceived negative attitude among the urban sample was 1.69 (SD=1.18). Among rural pharmacy staff, the average score was 2.44 (SD=.891). Results are displayed in Table 5.

Table 5: Significant Associations/Differences Based on Urban/Rural Pharmacies

	Urban		Rural		Total		Test Stat
Chain/Private	f	%	f	%	f	%	
Chain	79	63.2	29	30.5	108	49.1	$\chi^2=23.06^{***}$ (.000)
Private	46	36.8	66	69.5	112	50.9	
Pharmacy Carries EC	f	%	f	%	f	%	
Yes	76	60.8	35	36.8	111	50.5	$\chi^2=12.39^{***}$ (.000)
No	49	39.2	60	63.2	109	49.5	
Need Prescription	f	%	f	%	f	%	
Yes	1	1.4	4	12.9	5	4.9	$\chi^2=6.22^*$ (.013)
No	71	98.6	27	87.1	98	95.1	
Correct Answer: Efficacy Timeframe	f	%	f	%	f	%	
Correct	55	82.1	19	63.3	74	76.3	$\chi^2=4.030^*$ (.045)
Incorrect	12	17.9	11	36.7	23	23.7	
Correct Answer: EC is the same as Having Abortion	f	%	f	%	f	%	
Correct	62	92.5	18	64.3	80	84.2	$\chi^2=11.85^{***}$ (.001)
Incorrect	5	7.5	10	35.7	15	15.8	
Perceived Negative Attitude	M	SD	M	SD	M	SD	
(Higher Values= Worse attitude)	1.69	1.18	2.44	.891	1.92	1.04	t=3.53** (.008)
Correct Answers Total	M	SD	M	SD	M	SD	
(Higher values=Correct Knowledge Answers)	3.63	.956	2.87	1.50	3.40	1.19	t=-3.07** (.001)

Associations/Differences between Chain and Private Pharmacies

The likelihood of a pharmacy carrying EC was significantly associated with a pharmacy's designation as either chain or private. While 87% of chain pharmacies carried EC, just 15% of private pharmacies carried it ($\chi^2= 113.572$; $p=.000$). Of those private pharmacies that carried EC, over a third (35%) were out of stock at the time of the phone call, whereas 2% of chain pharmacies reported that the product was not in stock ($\chi^2= 23.68$; $p=.000$). Two percent of chain pharmacies told the caller that a prescription was required to purchase EC; over a quarter of private pharmacies indicated that a prescription was necessary ($\chi^2= 13.40$; $p=.008$). Similarly, chain pharmacies were much

more likely than private pharmacies to correctly inform the caller that she did not need to bring an adult, with 65% of chain pharmacies and 30% of private pharmacies responded correctly ($\chi^2= 4.74$; $p=.030$). Private pharmacies were also more likely to indicate that EC is equivalent to having an abortion; 44% of private and 13% of chain pharmacy staff indicated that EC caused abortion ($\chi^2= 6.14$; $p=.013$). Overall knowledge of EC between chain and private pharmacy staff was significantly different ($t=-2.58$; $p=.011$). On average, chain staff scored 3.50 ($SD=1.11$) on the 5-point knowledge scale. Private staff scored 2.55 ($SD=1.51$) on average. While EC knowledge was lower on average in private pharmacies when compared to chain pharmacies, EC was reportedly around \$7.46 cheaper at private pharmacies. The average cost of EC at private pharmacies was \$36.05; the average cost at chain pharmacies was \$43.51($t= 2.88$; $p=.005$). There was a significant difference in overall negative attitude between these two groups ($t= -2.13$; $p=.006$). The average score in perceived negative attitude among the chain sample was 1.83 ($SD=.960$). Among private pharmacy staff, the average score was 2.73 ($SD=1.37$). Table 6 below outlines the results.

Table 6: Significant Differences and Associations Based on Chain/Private Pharmacies

	Chain		Private		Total		Test Stat
Pharmacy Carries EC	f	%	f	%	f	%	
Yes	94	87.0	17	15.2	109	49.1	$\chi^2=113.572^{***}$ (.000)
No	14	13.0	95	84.7	111	50.9	
EC in Stock	f	%	f	%	f	%	
Yes	92	97.9	11	64.7	103	92.8	$\chi^2=23.68^{***}$ (.000)
No	2	2.1	6	35.3	8	7.2	
Need Prescription	f	%	f	%	f	%	
Yes	2	2.2	3	27.3	5	4.9	$\chi^2=13.40^{**}$ (.008)
No	90	97.8	8	72.7	98	95.1	
Correct Answer: Needs Adult	f	%	f	%	f	%	
Correct	60	65.2	3	30.0	63	62.4	$\chi^2=4.74^*$ (.030)
Incorrect	32	34.8	7	70.0	38	37.6	
Correct Answer: EC is the same as Having Abortion	f	%	f	%	f	%	
Correct	75	87.2	5	55.6	80	84.2	$\chi^2=6.14^*$ (.013)
Incorrect	11	12.8	4	44.4	15	15.8	
Price	M	SD	M	SD	M	SD	
	\$43.51	\$7.81	\$36.05	\$10.34	\$42.69	\$8.39	$t=2.88^{**}$ (.005)
Perceived Negative Attitude	M	SD	M	SD	M	SD	
(Higher Values= Worse attitude)	1.82	0.96	2.73	1.37	1.92	1.04	$t=-2.13^{**}$ (.006)
Correct Answers Total	M	SD	M	SD	M	SD	
(Higher values=More Discomfort)	3.50	1.11	2.55	1.51	3.40	1.19	$t=-2.58^{**}$ (.011)

Associations/ Differences between Pharmacists and Pharmacy Technicians

The only significant difference between pharmacists and pharmacy technicians was perceived gender. Of the pharmacists interviewed 47.1% were perceived to be male and 52.8% were perceived as female. Of the pharmacy technicians, only 20% were perceived as male while 80% were perceived to be female ($\chi^2= 7.93$; $p=.005$). There were no other significant differences between pharmacists or pharmacy technicians, including their responses to the knowledge-based questions. Results are displayed in Table 7 below.

Table 7: Associations/Differences Based on Job Title

	Pharmacist		Pharm Tech		Total		Test Stat
Perceived Gender	<u>f</u>	<u>%</u>	<u>f</u>	<u>%</u>	<u>f</u>	<u>%</u>	
Female	28	52.8	36	80	64	65.3	$\chi^2=7.929^{**}$ (.005)
Male	25	47.1	9	20	34	34.7	
Perceived Negative Attitude	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	
(Higher Values= Worse attitude)	1.91	1.02	1.85	.944	1.92	1.04	t =.269 (.787)
Correct Answers Total	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	
(Higher values=Correct Knowledge Answers)	3.32	1.16	3.56	1.18	3.40	1.19	t =-.993 (.323)

Factors on Likelihood of Pharmacy Carrying Emergency Contraception

The null hypotheses for this analysis were:

H_{01} = There will be no relationship between the likelihood of a pharmacy carrying EC and whether a pharmacy was a chain or private while accounting for other relevant factors.

H_{02} = There will be no relationship between the likelihood of a pharmacy carrying EC and whether a pharmacy was urban or rural while accounting for other relevant factors.

The dependent variable in this model was whether a pharmacy regularly carried EC. The independent variables of interest were “rural vs. urban” and “chain vs. private” pharmacy status. Perceived gender was a control variable in this analysis.

In the control model, perceived gender was a significant predictor of whether a pharmacy carries emergency contraception. Pharmacies where a male staff member responded were over three times as likely to carry EC (OR=3.26; p=.001). This first model was significant ($\chi^2= 12.605$, df=1; N=220; p=.000). Based on the pseudo-R estimates, the control model accounted for between 6% (Cox & Snell $R^2= .057$) and 8% (Nagelkerke $R^2= .076$) of the variance.

The addition of the chain vs. private pharmacy variable in the second model, perceived gender was no longer a significant factor. Holding gender constant, whether the pharmacy was chain or private was a significant predictor of whether the pharmacy carried EC. The odds of a pharmacy carrying EC are 97% lower when the pharmacy was privately operated (OR= .028; p=.000). This model was also itself significant ($\chi^2=129.926$, df=2; N=220; p=.000). Based on the pseudo-R estimates, the second model accounted for between 45% (Cox & Snell $R^2= .446$) and 60% (Nagelkerke $R^2= .595$) of the variance. This addition improved the model fit by 39-52%.

In the full model, the urban vs. rural variable was added, but it was not a significant predictor. The chain vs. private pharmacy variable remains significant at about the same level (OR= .027; p=.000). The full model was significant ($\chi^2= 130.005$, df=3; N=220; p=.000). The addition of the urban vs. rural variable did not change the pseudo-R estimates; and, therefore, did not significantly improve the model fit. Hence, we rejected H_{01} but failed to reject H_{02} . Results are reported in Table 8.

Table 8: Logistic Regression Results- Factors on Likelihood of Carrying EC

Variables	Model 1 Control Model Odds Ratios	Model 2 Chain or Private Odds Ratios	Model 3 Urban or Non- Urban Odds Ratios
Perceived Gender <i>Female= 0</i> <i>Male=1</i>	3.26** (.343)	2.45 (.473)	2.52 (.486)
Private Pharmacy <i>Chain= 1</i> <i>Private=2</i>	--	.028*** (.393)	.027*** (.416)
Urban Pharmacy <i>Non-Urban= 1</i> <i>Urban=2</i>	--	--	.887 (.426)

Standard errors are reported in parentheses; *p < .05; **p < .01; ***p < .001

Urban or Non-Urban Location on Likelihood of Pharmacy Being Chain or Private

The null hypothesis associated with this analysis was as follows:

H_0 = There will be no relationship between the likelihood of a pharmacy being chain or private and whether a pharmacy was in a rural or urban setting.

The dependent variable in this model was whether a pharmacy is a chain or privately operated and the only independent variable was whether a pharmacy was urban or non-urban/rural. In this model, the location of the pharmacy (rural vs. urban) was a significant predictor of whether a pharmacy was privately operated or a chain. An urban pharmacy was 74% less likely to be privately operated than a non-urban pharmacy (OR= .256; $p=.000$). Model was significant ($\chi^2= 23.542$, $df=1$; $N=220$; $p=.000$). Based on the pseudo-R estimates, the second model accounted for between 10% (Cox & Snell $R^2=.101$) and 14% (Nagelkerke $R^2=.135$) of the variance. Given these results, H_0 was rejected.

Factors on Pharmacy Staff Knowledge of Emergency Contraception

The null hypotheses associated with this analysis were as follows:

H_{01} = There will be no relationship between the pharmacy staff knowledge of EC and whether a pharmacy was a chain or private while accounting for other relevant factors.

H_{02} = There will be no relationship between the pharmacy staff knowledge of EC and whether a pharmacy was urban or rural while accounting for other relevant factors.

The dependent variable in this model was the 5-point overall EC knowledge scale described in the measurements above. The independent variables of interest were “rural vs. urban” and “chain vs. private” pharmacy status. The control variables were perceived gender and job title.

Neither control variable (perceived gender and job title) was a significant predictor of pharmacy staff knowledge of EC in the control model. The second model adds the “private vs. chain” pharmacy variable. With the inclusion of this variable, the gender and job title were still not significant predictors. Whether a pharmacy was a chain or private pharmacy was a significant predictor while controlling for gender and job title. Pharmacy staff from private pharmacies were expected to score over half a point lower on the overall knowledge scale ($\beta = .637$; $p = .010$). The third model added the “urban vs. rural” variable. When this variable was included, whether a pharmacy was chain or private was no longer a statistically significant predictor. However, whether a pharmacy was located in a rural or urban area was a significant predictor of pharmacy staff knowledge while controlling for gender, job title, and chain/private pharmacy status. Pharmacy staff members from urban pharmacies were expected to score over half a point higher on the overall knowledge scale when compared to staff members from rural pharmacies ($\beta = .608$; $p = .016$).

The full model explains nearly 14% of the total variance ($R^2 = .136$). This indicated an improvement in model fit of nearly 13% when compared to the control model ($R^2 = .012$). When compared to the second model, the full model improved model fit by around 6% ($R^2 = .080$). The entire model was also significant ($F = 3.655$; $p = .008$).

Given these results H_{02} was rejected while we failed to reject H_{01} . The results are displayed in Table 9.

Table 9: Linear Regression Results- Factors on Overall Knowledge of EC

Variables	Model 1 Control Model Unstandardized Coefficients	Model 2 Chain or Private Unstandardized Coefficients	Model 3 Urban or Non- Urban Unstandardized Coefficients
Perceived Gender <i>Female= 0</i> <i>Male=1</i>	.121 (.296)	-.020 (.292)	-.140 (.288)
Reported Job Title <i>Pharmacist= 1</i> <i>Pharm Tech=2</i>	.269 (.253)	.319 (.246)	.326 (.240)
Private Pharmacy <i>Chain= 1</i> <i>Private=2</i>	--	-.637** (.241)	-.465 (.245)
Urban Pharmacy <i>Non-Urban= 1</i> <i>Urban=2</i>	--	--	.608* (.248)

Standard errors are reported in parentheses; *p < .05; **p < .01; ***p < .001

Factors on Perceived Negative Attitude of Pharmacy Staff

The null hypotheses associated with this analysis were as follows:

H_{01} = There will be no relationship between the negative attitude of the pharmacy staff and whether a pharmacy was a chain or private while accounting for other relevant factors.

H_{02} = There will be no relationship between the negative attitude of the pharmacy staff and whether a pharmacy was urban or rural while accounting for other relevant factors.

The dependent variable in this model was the 5-point Perceived Negative Attitude scale described in the measurements above. Again, the independent variables of interest were “rural vs. urban” and “chain vs. private” pharmacy status. The control variables were perceived gender and job title.

Neither control variable (perceived gender and job title) was a significant predictor of pharmacy staff attitudes in this first model. The second model added the “private vs. chain” pharmacy variable. Neither the new variable nor the original control variables were significant in this second model. The third model added the “urban vs. rural” variable, which was a significant predictor of perceived attitudes of the pharmacy staff. Pharmacy staff from urban areas were expected to have a score over a half point lower on the negative attitude scale than those from rural areas ($\beta = -.622$; $p = .007$). Interestingly, the inclusion of this variable also rendered the perceived gender variable significant. Perceived male members of pharmacy staff were expected to have a negative attitude score of nearly a half point higher than those perceived female ($\beta = -.464$; $p = .028$).

The full model explained nearly 13% of the total variance ($R^2 = .129$). This indicated an improvement in model fit of nearly 9% when compared to the control model ($R^2 = .035$). When compared to the second model, the full model improved model fit by around 7% ($R^2 = .057$). The entire model was also significant ($F = 3.438$; $p = .011$). Given these results H_{02} was rejected while we failed to reject H_{01} . The results are displayed in Table 10.

Table 10: Linear Regression Results- Factors on Perceived Negative Attitude of Pharmacy Staff

Variables	Model 1 Control Model Unstandardized Coefficients	Model 2 Chain or Private Unstandardized Coefficients	Model 3 Urban or Non-Urban Unstandardized Coefficients
Perceived Gender <i>Female= 0</i> <i>Male=1</i>	.393 (.216)	.409 (.215)	.464* (.208)
Reported Job Title <i>Pharmacist= 1</i> <i>Pharm Tech=2</i>	.053 (.206)	.018 (.246)	.003 (.240)
Private Pharmacy <i>Chain= 1</i> <i>Private=2</i>	--	.509 (.342)	.183 (.351)
Urban Pharmacy <i>Non-Urban= 1</i> <i>Urban=2</i>	--	--	-.622** (.244)

Standard errors are reported in parentheses; *p < .05; **p < .01; ***p < .001

Additional Comments

Occasionally during the interviews, a respondent would provide anecdotal information which would be recorded. The following is a list of these details:

1. 5 respondents offered to order EC when it was not in stock
2. 4 mentioned the local health department or a free clinic as a source of free EC
3. 3 suggested talking to a doctor instead of calling the pharmacy
4. 2 indicated low-demand as the reason they do not carry EC ("It expired on the shelf")
5. 1 refused to check the price
6. 1 recommended an out-of-county pharmacy
7. 1 told the caller that insurance may cover it

8. 1 recommended that the caller seek long-term birth control because EC is “a backup method”

After asking the question about whether EC is the same as having an abortion, many respondents would explain how EC works or offer other comments. The following list details these remarks.

1. 6 respondents correctly indicated that it will not harm an existing pregnancy
2. 7 incorrectly indicated that it could potentially harm an existing pregnancy and/or cause abortion
3. 3 respondents correctly indicated that it blocks fertilization
4. 2 correctly indicated that it prevents ovulation
5. 1 indicated that it triggers menstruation
6. 1 said “it prevents the baby from forming”
7. 1 said “it’s not abortion but I don’t know how it works”
8. 2 verbally refused to answer this question
9. 7 hung up when asked this question

Chapter 5

DISCUSSION AND RECOMMENDATIONS

As demonstrated in this study, adolescents seeking information about over-the-counter emergency contraception in Kentucky were likely to face many barriers. Although barriers to EC were found throughout the state, they were especially concentrated in rural areas. Prior research in other states has demonstrated rural disparities in access to EC products and accurate information relating to emergency contraception (Mackin & Clark, 2011; Samson et. al., 2013; Gaffaney et. al, 2015). This study demonstrated that similar inequities between rural and urban areas exist in the state of Kentucky.

Physical and Economic Barriers to Emergency Contraception

Nearly half of the pharmacies called did not carry EC at all. Further, over a third of pharmacies that did not carry EC were not able to recommend an alternative provider. Those pharmacies were more likely to be private, rural pharmacies. These results are consistent with the 2013 Kansas “secret shopper” study (Samson et al., 2013) which found that urban pharmacies were twice as likely to have EC available at the time of the call as were those in rural areas. This study also found that chain or private pharmacy status was a better predictor of EC availability than was rural or urban status alone. Seven-in-ten private pharmacies surveyed did not stock over-the-counter EC, and the choice of merchandise stocked at chain pharmacies is dictated by corporate policies developed outside the state. Therefore, except for those pharmacies obligated by company-wide policy to carry the product, most of the surveyed Kentucky pharmacies opted not to carry it. The specific reasons for this practice are unidentified and beyond the

scope of this research. Still, recognizing that there were differences between urban and rural availability is imperative. The fact that an urban pharmacy was 74% less likely to be privately-operated means that the lack of availability in private pharmacies affected those in rural areas most.

About half of the surveyed pharmacies stored their EC in a manner that requires an adolescent seeking EC to interact with an employee (either locked on the sales floor or behind the pharmacy counter). Anxiety about having to discuss personal and potentially embarrassing information with an unknown staff member has been determined to be a deterrent for an adolescent (Gaffaney, et al., 2015). Per the data, chain pharmacies were more likely to have EC available unlocked on the sales floor, and chain pharmacies are concentrated mostly in urban areas. Again, rural Kentucky adolescents would face greater barriers to obtaining the product.

The findings in this study demonstrated that EC price may also be a barrier for teenagers in Kentucky. If paid out-of-pocket, the average cost of EC in the state is \$42.69, which is likely not affordable for most teenagers. However, EC in private pharmacies was found to be \$7.46 cheaper than EC in chain pharmacies. While \$36.05, the average cost of EC at private pharmacies stocking EC, may be more affordable, it is important to note that most private pharmacies did not carry EC at all while chain pharmacies were nearly twice as likely to stock it. As mentioned in prior research (e.g., Bell, Camacho, & Velasquez, 2014), the price of over-the-counter EC can be an economic barrier to obtaining EC in a sufficiently timely manner.

Pharmacy Staff-Associated Barriers to Emergency Contraception

Staff-associated barriers are those barriers that exist only as a result of misinformation provided to the adolescent customer. These barriers may include lack of knowledge on the part of pharmacy staff and/or attitudes of pharmacy staff which may motivate them to prevent access to EC.

Barriers Created by Lack of Knowledge among Pharmacy Staff

In this study, the average negative attitude score was low, only 1.92 out of 5. However, the overall knowledge average was 3.4 out of 5 indicating several gaps in knowledge. Consistent with the literature, this finding indicated that an honest lack of knowledge may be a greater barrier than attitudes against providing EC to adolescents. Studies discussed in the literature review found pharmacy staff lack of knowledge to be a significant barrier to timely access to EC among their clients. Wilkinson and colleagues (2012) found that researchers acting as physicians needing information about age restrictions to over-the-counter EC access were nearly as likely to have received the wrong information as researchers pretending to be adolescents. This indicates that the pharmacy staff members were truly uninformed rather than intentionally deceptive.

Of the Kentucky pharmacies interviewed for this study, 95% correctly stated that no prescription was required, and only 38% incorrectly stated an age requirement. However, 65% of those answering correctly were chain pharmacies, which are concentrated in urban areas. Therefore, misinformation about age requirements more heavily affects rural areas of the state. Previous research by Wilkerson and colleagues (2012) and Orr and colleagues (2015) found that more than half of the pharmacies included in their studies provided the incorrect age requirement for EC purchase without a prescription.

Over a quarter (28%) of sampled pharmacies in this study reported an incorrect efficacy timeframe for EC (up to 72 hours) with 37% of rural pharmacies giving an incorrect timeframe, compared to just 18% of urban pharmacies. Further, 55% incorrectly stated how effective EC is, typically overestimating its efficacy, and only one pharmacy recommended that the caller seek a long-term birth control method. These findings are problematic as demonstrated in the literature. Baird and colleagues (2015) discussed how improper use and overestimation of EC's effectiveness leads to overreliance on EC as a primary birth control method. Similarly, in their 2012 study of Utah women who used EC more than once during the year, Melton, Stanford and Dewitt found that successfully using EC once led repeat users to overestimate its effectiveness. If Kentucky pharmacy staff workers are misleading their customers into misusing EC, they are contributing to the problem of overreliance on a birth control method that can readily fail to prevent pregnancy if not used in a timely and correct manner.

In 2011, Mackin and Clark found that 38% of surveyed Iowa pharmacists believed that over-the-counter EC functioned as an abortifacient. Similarly, Richman and colleagues (2012) found that 46% of Florida pharmacists who responded to their survey believed that EC induced abortion. Compared to these previous findings, the rate at which Kentucky pharmacy staff members told the interviewer that EC caused an abortion was much lower: just over 1-in-5 (21.6%) gave this answer. While that is comparatively better, the number still indicates that misinformation perpetuating the idea that over-the-counter EC functions as an abortifacient remains a concern. Whether this was simple a misunderstanding or a moral objection on the part of the pharmacy staff member, the issue needs to be addressed. Telling an adolescent client that EC can cause an abortion

may inadvertently make the pill seem much more effective in preventing pregnancy than it actually is, further contributing to the problem of overreliance.

Pharmacy Staff Attitudinal Barriers

The negative attitude scale was a 5-point scale based on subjective scorings of the attitudes of the person interviewed. The perceived attitudes included in this measure were unhelpfulness, discomfort, and judgmental nature. Overall, negative attitude scores were low with an average of 1.92 out of 5. However, teenagers in rural areas are more likely to encounter negative attitudes when seeking EC. The linear regression results indicated that urban pharmacy staff members were expected to score more than half a point lower on the 5-point scale than those in rural areas. On average, urban pharmacies scored 1.69 out of 5 on perceived negative attitude; rural pharmacies scored 2.44 out of 5 on average. This was in line with the findings of Richard, Kinzey, and Masters (2015) in their study of rural pharmacist attitudes toward contraception in general. Most of the rural pharmacists surveyed in that study demonstrated discomfort about providing over-the-counter access to contraception to their patients and many actively opposed the prescription of contraceptives (Richard, Kinzey, and Masters, 2015). It is important to note that, while the negative attitude average among the rural sample was significantly higher than those in the urban sample, it was still lower than half. Although perceived negative attitude is a recognized barrier for rural EC access, lack of knowledge among the pharmacy staff likely plays a greater role and offers a more effective route for intervention.

Pharmacy Technicians vs. Pharmacists

For the most part, counseling on EC was lacking in this study. For example, higher body weight reduces the efficacy of over-the-counter EC and women should be

advised to transition to a permanent form of birth control with higher efficacy (Cleland, Raymond, Westley & Trussell, 2014). However, only one pharmacist in this study recommended a long-term birth control and none mentioned the weight contraindication. This is consistent with Young, Griffin, and Vest (2013) who found that, despite their pharmaceutical education, pharmacists are underprepared to counsel those seeking over-the-counter emergency contraception.

Young, Griffin and Vest (2013) found that just 25% of the 200 graduating students from Midwestern University's College of Pharmacy in the study felt confident in counseling patients on EC use. The most common self-reported barrier in that study was lack of knowledge. Of those interviewed in this study, 51.46% were pharmacists and 43.69% were pharmacy technicians with the remaining 4.85% being some "other" professional. Because of their educational level, it is reasonable to expect a pharmacist to answer the knowledge-based questions more accurately than a pharmacy technician. However, this study found no difference in overall knowledge or negative attitudes between pharmacists and pharmacy technicians.

Study Strengths

This research was the first effort to understand pharmacy-based barriers to adolescent access to over-the-counter contraception through a simulated experience in the state of Kentucky. Unlike survey research that would rely on adolescent's self-reporting their own experiences, this study allowed the researcher to witness the pharmacy-adolescent interaction, reducing the risk of report bias. Additionally, only one researcher made the phone calls included in this study. Therefore, there was a level of standardization in that every respondent talked to the same person. This helped assure

that believability of the phone call and the framing of the questions was generally consistent.

Unlike other “secret shopper” studies conducted to determine a teen’s experience while seeking over-the-counter EC in a pharmacy setting, this research utilized regression analyses to control for other factors that could impact knowledge, attitudes, and EC availability beyond “rural vs. urban” and “chain vs. private.” Additionally, this research looked at the impact of pharmacy operation type. The inclusion of the “chain vs. private” measure in addition to the “rural vs. urban” measure provided a better understanding of what factors determine EC availability in a pharmacy. While past “secret shopper” studies of this topic identified a disparity between urban and rural availability of over-the-counter EC (Gaffaney et al., 2015; Wilkinson et al., 2012), they did not control for the influence of “chain vs. private” which may have confounded their results. Only one previous survey on EC availability, conducted by Samson and colleagues (2013) controlled for “chain vs. private,” but that survey, conducted in 2012 (before the 2013 regulatory change) was not a “secret shopper” study and did not control for any characteristics of the respondent.

Study Limitations

The non-probability sampling technique of this study was one of its major limitations. The number of counties chosen for the rural/Appalachian sample was determined based on the affordability of obtaining the per-county list of registered pharmacies from the Kentucky Board of Pharmacies. Due to limited time and resources, the sample may not be representative of the entire state.

Since the interviews were semi-structured, questioning and responses were often altered based on the unanticipated flow of conversation. Generally, the caller tried to follow the script as written, but occasionally the interviewees' responses or tone of voice caused the researcher to ask questions differently due to such occurrences as emotional arousal or simply because the interviewee offered answers to questions that were not yet asked. Therefore, these interviews were not standardized although the same information was sought during each one.

The questions assessing perceived negative attitudes were based on one researcher's perception of a respondent's unhelpfulness, discomfort, and judgmental nature. Hence, these measures were completely subjective and another researcher may have perceived these conversations differently. Originally, the study design included recording the audio of these interviews and having other researchers rate the conversations based on these measures. However, the Institutional Review Board did not approve of recording the interviews.

This research should be considered as justification for further investigation into the distribution of pharmacy-based barriers to adolescent access to over-the-counter EC in our state. This study added to the body of literature in this area and future research should work to overcome the study limitations outlined above.

Recommendations

The primary pharmacy staff-associated barrier identified in this research was lack of knowledge. The research also revealed that, while barriers were evident throughout the state, all measured barriers were more heavily concentrated in rural areas of Kentucky. The following recommendations are based primarily on these findings.

First, because of the time restricted nature of this product and the fact that it is only to be used as a last resort, pharmacy staff should receive more training on how to accurately and knowledgably counsel anyone seeking over-the-counter EC and how to best discuss this topic with adolescent clients. Several studies have found that adequate counseling in the pharmacy setting leads to proper EC use and better outcomes for both pharmacy staff and clients. Ragland, Payakachat, and Stafford (2015) found that when pharmacy students counseled female participants for just ten minutes on the basics of use of and access to EC, the women immediately scored higher on tests measuring their knowledge of EC. The follow-up tests conducted several months later also showed significantly higher scores in EC knowledge, demonstrating that a minimal 10-minute educational exercise in a pharmacy setting can lead to an immediate increase in understanding of EC and continued retention of this knowledge. Batra, Aquilino, and Farris (2015) evaluated pharmacy staff of 55 pharmacies that had all participated in an online education intervention aimed at demonstrating what they can do as healthcare professionals to decrease unplanned pregnancy. After intervention, the authors found that 90% of participating staff reported more confidence in discussing contraceptives because of the intervention and wanted to prioritize the topic. Young, Griffin, and Vest (2013) studied two hundred third-year pharmacy students who participated in hands-on skits to practice emergency contraceptive counseling. Prior to the workshop, only 25% of the pharmacy students reported confidence in counseling patients on EC use. Following participation in the exercise, 58.8% reported confidence in their counseling EC ability. Given that prior evidence supports the efficacy of pharmacy-based counseling and that the pharmacy staff are the experts available at the point of purchase, interventions to

improve their ability to adequately counsel anyone seeking over-the-counter EC as well as teenagers specifically should be developed and implemented throughout the state and especially in rural regions.

Second, the public generally should be better informed about the proper use of over-the-counter EC, the current lack of age restriction, and general facts about how it functions and its efficacy. Devine (2012), seeking to explain why increased access to over-the-counter EC did not result in a decrease in unintended pregnancies, argued that lack of effectiveness to a combination of lack of awareness of the nature of EC and its over-the-counter status, the incorrect belief that it is an abortifacient, privacy concerns, and concerns over adverse health effects among the general public. Baird and colleagues (2015) argued that in addition to the need for greater public awareness of and access to emergency contraception, public health interventions need to aim at ensuring that women who use EC will transition successfully afterwards to regular, more effective birth control methods and to prevent overreliance on EC. Melton, Stanford, and Dewitt (2012) studied women who had used EC more than twice in the year to better understand overreliance. They found that most repeat users overestimated the efficacy of the products. The authors asserted that women who repeatedly use EC successfully likely overestimate its effectiveness. Efforts to increase access must also avoid inducing dependence on EC as more than a backup method of contraception. Therefore, along with removing accessibility barriers to over-the-counter EC, it is the responsibility of the public health system to assure that as many women as possible receive accurate information about proper use of EC. This goal may be best achieved via a social marketing or mass media campaign implemented throughout the state of Kentucky and in rural areas specifically.

In addition to creating a mass public health education campaign to increase general knowledge of the proper use of EC, the public health system should better advertise the fact that, in the state of Kentucky, emergency birth control is offered through health department clinics free of charge in addition to other family planning services (Kentucky Cabinet for Health and Family Services, 2015). While hours and locations of the health departments may pose barriers for adolescents who lack transportation or who are attending school, for those who can get to the health department, it removes the financial burden and includes accurate EC counseling and referrals to other services such as those providing long-term birth control and STI testing (Kentucky Cabinet for Health and Family Services, 2015).

Third, adolescents should have access to accurate knowledge about their reproductive health and about contraception generally. A significant problem facing teens is a lack of reproductive education. The number of American female adolescents receiving no formal instruction in school about birth control methods rose to 26% as of 2013 (Guttmacher Institute, 2016d). This lack of education is most concentrated in rural America: as of 2013 only 48% of adolescent females in rural counties were receiving formal education on birth control methods and in 2014, only 35% of high schools reported that they included proper condom use in their reproductive health curriculum (Guttmacher Institute, 2016d). A 2011 study by Kathrin Stanger-Hall and David W. Hall found a high correlation between those states with school curricula requiring or promoting abstinence as the only safer-sex option and those states with higher teen pregnancy and birth rates. Even when controlled for socio-economic status and race, the study found that states which adopted more comprehensive sex-education programs had

lower rates of unintended teen pregnancy while those providing abstinence-only education had the highest rates of unintended teen pregnancy (Stanger-Hall & Hall, 2011). While this type of intervention would likely face social opposition in the areas of our state that are most affected by teenage pregnancy, formal education on reproductive health, safe sex, and contraception, including education on the proper use of over-the-counter EC, is one of the most effective ways for preventing unintended pregnancy and STIs among teenagers (Stanger-Hall & Hall, 2011).

Chapter 6

CONCLUSION

It is critical that every individual receive accurate information that allows them to make informed decisions about their own body and health, including reproductive health. This includes adolescents, who are among the most at-risk and least advantaged members of our society. Adolescents typically lack the education, the financial resources, and the personal freedom needed for self-determination. Yet the reproductive decisions they make or have made for them may follow them and determine the course of the rest of their lives. The limited contraceptive options available to adolescents may become even more restricted. Given the present precarious nature of reproductive healthcare funding and availability, Emergency Contraception has never been a more important tool for those members of our society who have the least access to contraceptive options. Therefore, those who are regarded as experts within the pharmacy should be informed and empowered to meet their responsibility of providing effective counseling to clients seeking over-the-counter EC.

The recommendations offered in this thesis are consistent with the reproductive health goals set forth by Healthy People 2020 plan and Public Health 3.0. One of the Healthy People objectives for family planning is to lower unintended pregnancy by 10% by 2020. This objective falls within the overall goal of improving pregnancy planning and spacing and preventing unintended pregnancy generally (HHS, 2014). Public Health 3.0, building on the work of Healthy People 2020, calls on public health practitioners to work across sectors and advocate for public health policies and programs that promote health equity by directly affecting the social determinants of health. Education is one of

the key social determinants identified by Public Health 3.0 as needing greater attention by the public health system (HHS, 2016). Since unintended pregnancy is correlated with lower educational attainment (Guttmacher Institute, 2016a), advocating for better reproductive and contraceptive education for both adolescents and the public at large can contribute to improving overall educational attainment, especially among at-risk populations. Efforts to rescind the reproductive options guaranteed under the Patient Protection and Affordable Care Act, to defund many reproductive healthcare providers, and to allow employers religious exemptions from contraceptive coverage will, if realized, frustrate plans to increase contraceptive access, to reduce unintended pregnancies, and to achieve health equity on this front.

The results and recommendations presented herein represent a timely contribution to the effort to understand how better to make EC available to the public, to inform those seeking EC of its proper usage, and to continue to advance the public health interests of the American people in the face of even greater adversity than previously expected.

This thesis successfully answered each of the five research questions set forth in the Purpose of the Study. In summary, analysis of the collected data revealed that:

1. Yes, there were differences in/associations between affordability, physical accessibility, pharmacy staff knowledge and pharmacy staff attitudes based on whether a pharmacy is rural or urban. These differences were demonstrated via the preliminary analyses and offer insight into the specific disparities between the urban and rural Kentucky pharmacies in the survey.
2. Yes, there were differences in/associations between affordability, physical accessibility, pharmacy staff knowledge and pharmacy staff attitudes based on

whether a pharmacy is chain or privately owned. Again, these differences were discovered initially through the preliminary analyses. While the differences based on chain or privately-owned status were themselves informative, the fact that urban pharmacies were 74% less likely to be privately-owned and that chain pharmacies performed better on nearly every measure further revealed the inequities faced by those in rural parts of the state.

3. Yes, factors such as whether a pharmacy was chain or privately operated or whether it was urban or rural did in fact predict a pharmacy's likelihood of carrying EC. While initially it seemed that "urban or rural" was a significant factor in whether the pharmacy carried over-the-counter EC, the final model demonstrated that whether a pharmacy was a chain or privately owned was a better predictor of whether the pharmacy carries the product.
4. Yes, factors such as whether a pharmacy was chain or privately operated or whether it was urban or rural did predict the level of EC knowledge among pharmacy staff. Here it seemed initially that the chain or private status of a pharmacy played a role in the overall knowledge level of its staff. However, the final model showed that, in fact, rural or urban location was a better predictor of overall EC knowledge.
5. Yes, factors such as whether a pharmacy was chain or privately operated or whether it was urban or rural did predict the level of negative attitudes demonstrated by pharmacy staff. As with question four, in the first model the chain or private status of a pharmacy appeared to play a role in the staff's

level of negative attitudes. However, the final model showed that, in fact, rural or urban location was a better predictor of overall negative attitudes as well.

Still, it is important to recall that this measure was subjective as mentioned in the study limitations section of this thesis.

By answering the selected research questions, this thesis made three distinct contributions to the field of knowledge in public health.

First, this thesis represents the first time that data on the availability of over-the-counter EC to adolescents in the state of Kentucky has been collected and presented. Indeed, the relevant literature reveals that extensive collection and analysis of data derived from interactions which simulated the experience of an adolescent seeking EC have been conducted in only a few other states. The addition of this unique data and its analysis to the literature is not only useful for further study of over-the-counter Emergency Contraception accessibility in Kentucky pharmacies and for use in the design of public health interventions within the state; it also serves to increase the understanding of over-the-counter Emergency Contraception access nationwide when added to the extant literature on EC access in other states.

Second, this thesis added to the literature consideration of a factor not accounted for in other “secret shopper” studies of barriers to emergency contraception access; namely, the chain or private ownership of the pharmacies surveyed. This thesis has identified chain vs. private ownership as the foremost determining factor in whether a pharmacy carries over-the-counter EC. It is likely that the corporate policies of the chain pharmacies obligated them to offer over-the-counter EC. Therefore, this study found that when a pharmacy was not obligated by policy to carry the product, most of the surveyed

Kentucky pharmacies elected to not carry it. However, many factors beyond the scope of this thesis may contribute to this, such as differences in pharmacist and staff education or employer provided training, differences in religious and other beliefs, the effect of an urban or rural environment on those beliefs, financial burdens faced by the private pharmacies, and so on. In any case, the role of chain vs. private ownership should be included in any further research into pharmacy-based barriers to EC access, and should also be considered in the planning of future public health policy and interventions regarding over-the-counter Emergency Contraception access.

Third, this thesis demonstrated that barriers to over-the-counter Emergency Contraception access, while prevalent across Kentucky, were much higher in the state's rural counties. As previously stated, the greatest factor in predicting that a pharmacy would not carry EC was shown to be private ownership. Seven-in-ten of Kentucky's rural pharmacies are privately operated, and private pharmacies were only about half as likely to carry EC as are chain pharmacies, regardless of urban or rural setting. Given that chain pharmacies were concentrated in urban counties, the state's rural population has limited access to chain pharmacies and relies primarily on private pharmacies. Thus, many small population centers may have no local pharmacy access to EC at all.

In addition to the greater likelihood of rural pharmacies being private and, therefore, less likely to carry Emergency Contraception, this thesis also revealed that, on average, rural pharmacy staff in the sample were less helpful when asked for information about EC, more judgmental of a perceived adolescent asking for EC, more uncomfortable discussing EC with an adolescent, less knowledgeable of the proper use, efficacy, and legal status of over-the-counter EC than their urban peers, and less likely to be able to

refer the caller to another pharmacy. The data also revealed the average cost of EC at private pharmacies that did carry EC to be lower than at chain stores; however, this advantage would be of no benefit to most rural residents of Kentucky due to the low number of private, rural pharmacies stocking EC.

In summary, this thesis has identified the key factors determining adolescent barriers to over-the-counter Emergency Contraception in Kentucky pharmacies and has determined the relative importance of those factors. This thesis has also provided previously unavailable data and analysis which may be used to support future research on access to EC and public health interventions within Kentucky and beyond. It has provided evidence of the existence of greater barriers to EC access in Kentucky's rural pharmacies. It has demonstrated that among the sampled pharmacies, the private ownership of a pharmacy was more determinative of likelihood of carrying EC than its rural location and has suggested this as an avenue of further inquiry. Lastly, this thesis has provided recommendations which, if implemented, will increase access to and the effective use of over-the-counter EC. In so doing, this thesis has not only substantively contributed to the literature on adolescent Emergency Contraception but has contributed to fulfilling the responsibility of Public Health to promote the reproductive health of all individuals and, specifically, to advocate for those least empowered to advocate for their own reproductive rights.

Appendices

Appendix I: Flow Chart of Survey Instrument

The following chart is designed to outline the flow of conversation during the semi-structured interviews. The green arrows indicate “yes” answers; the red arrows indicate “no” answers; and black arrows illustrate the conversational flow when the question will not elicit a yes or no response.

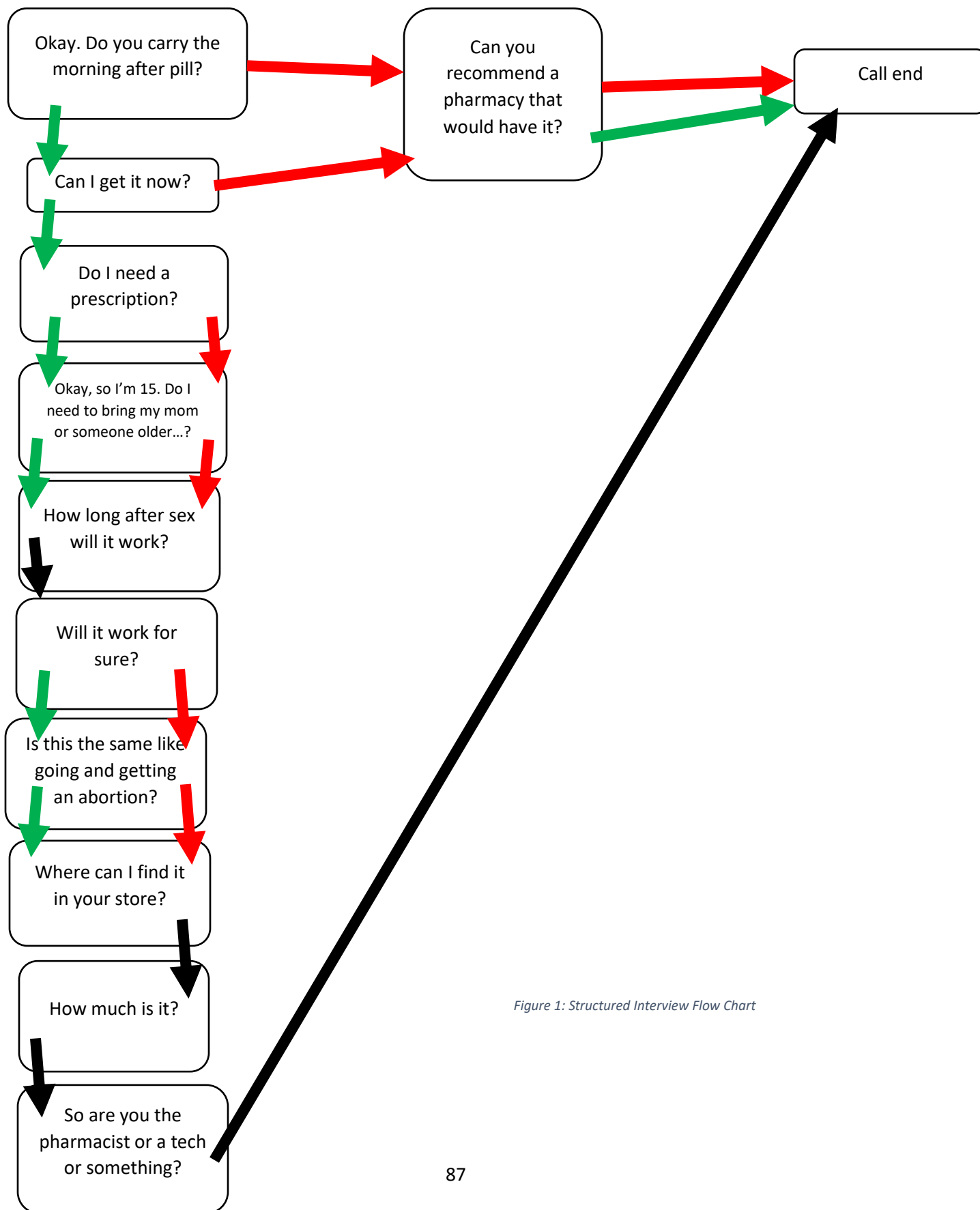
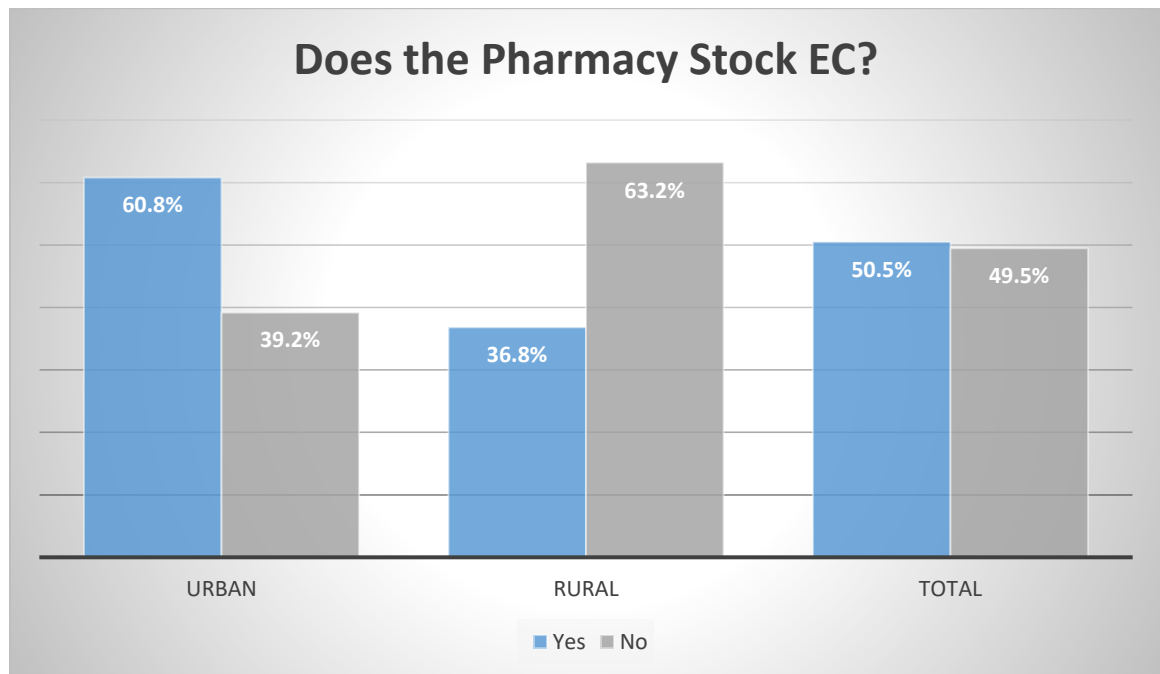
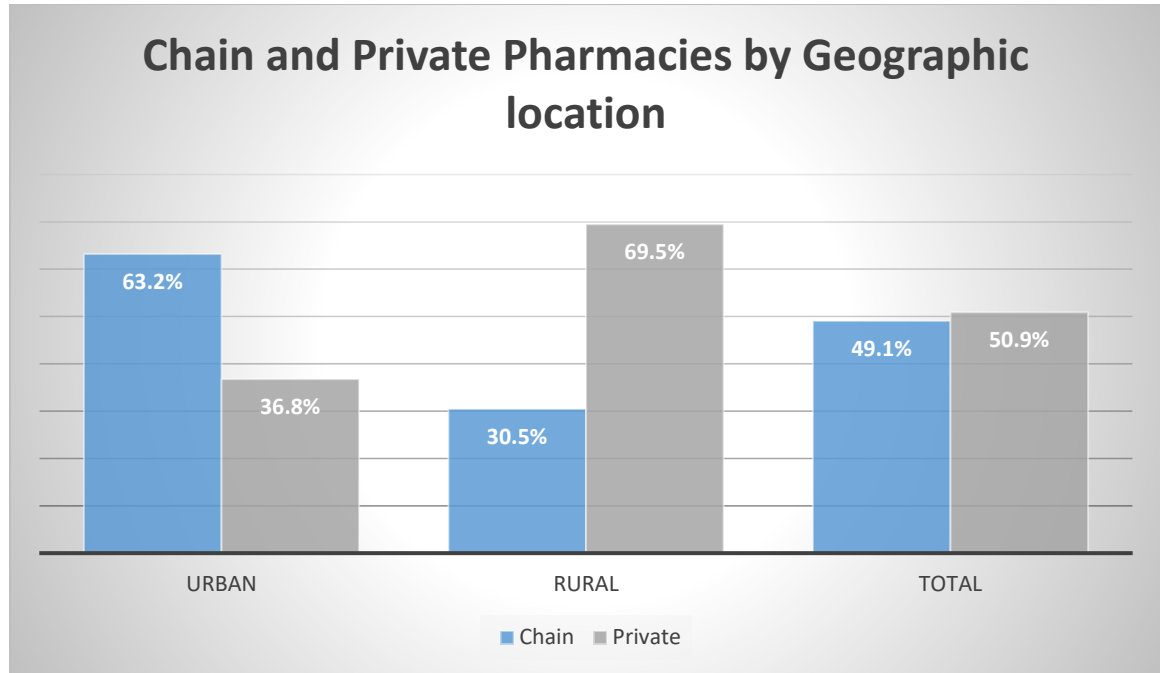
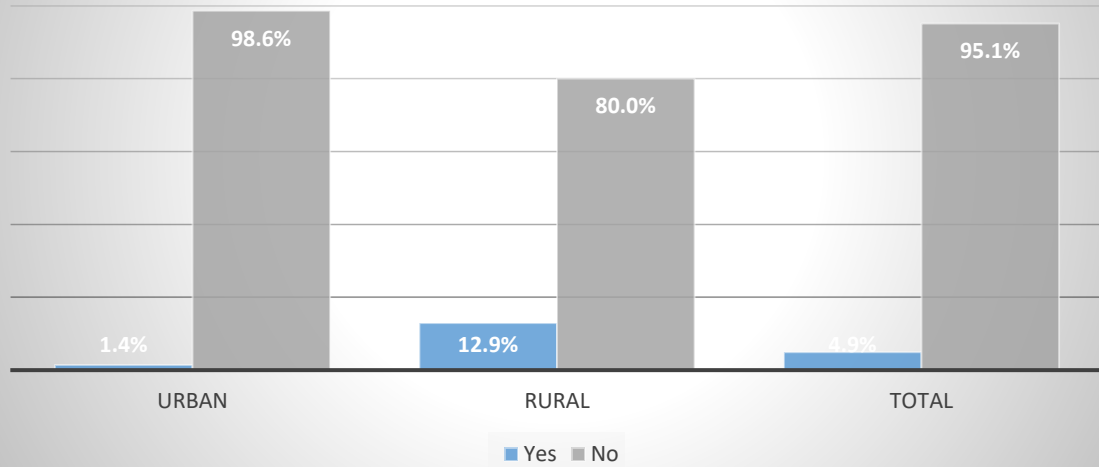


Figure 1: Structured Interview Flow Chart

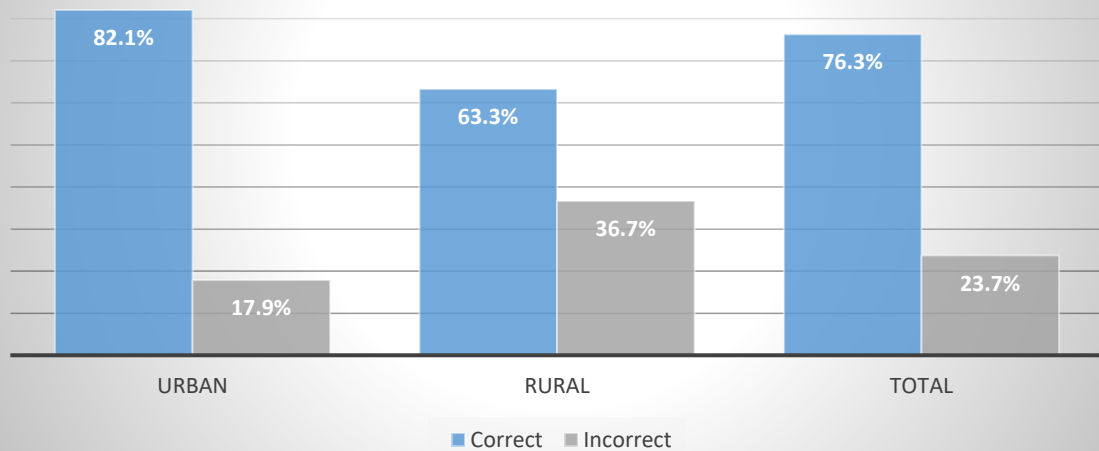
Appendix II: Significant Differences/ Associations Between Urban and Rural Pharmacies



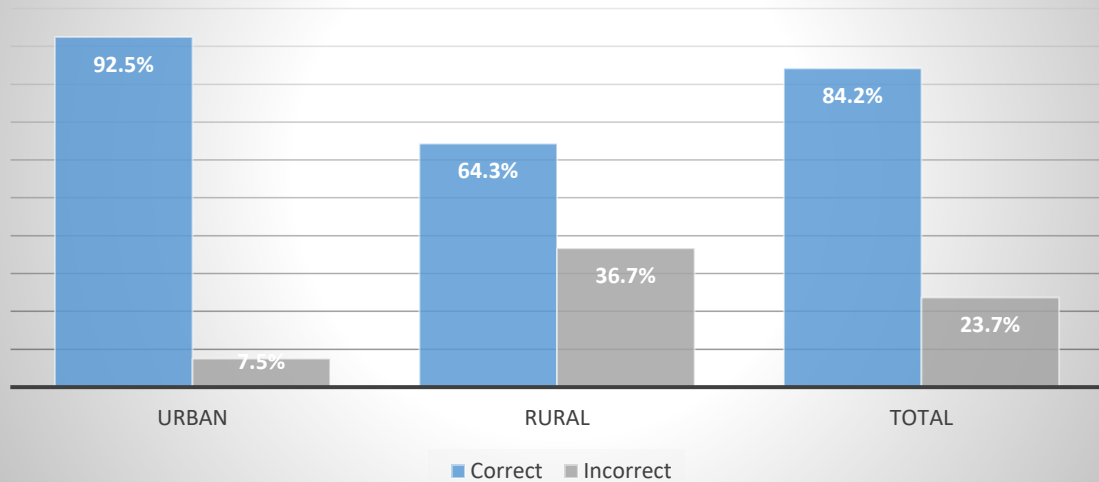
Need a Perscription to Purchase?



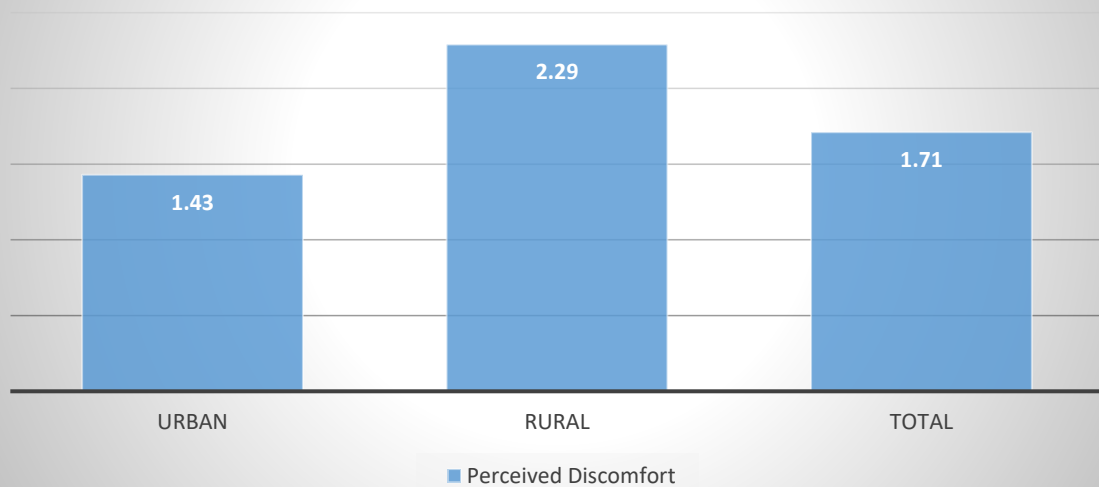
Correctly Stated Recommended Timeframe? (up to 72 hours after unprotected sex)



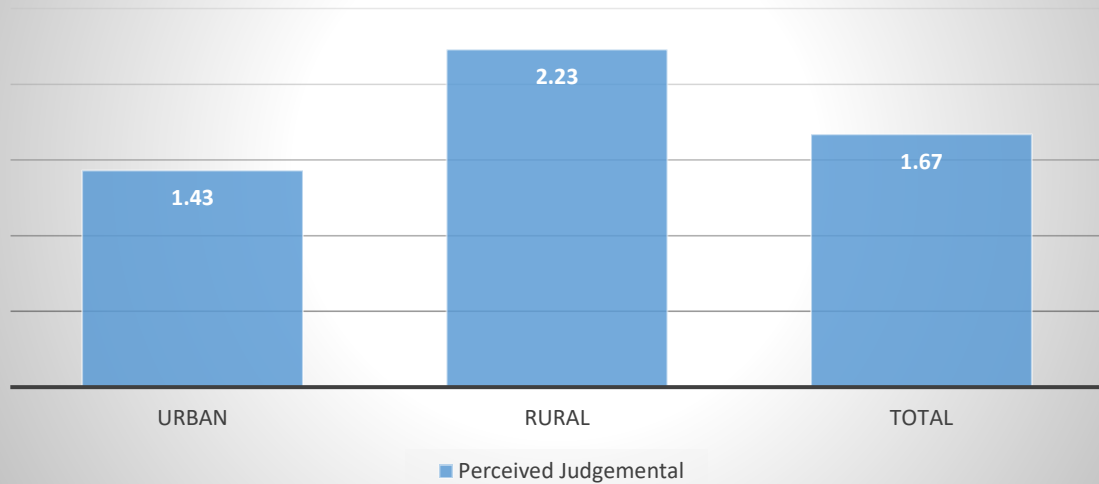
Correctly Stated that EC is not the Same as Seeking an Abortion?



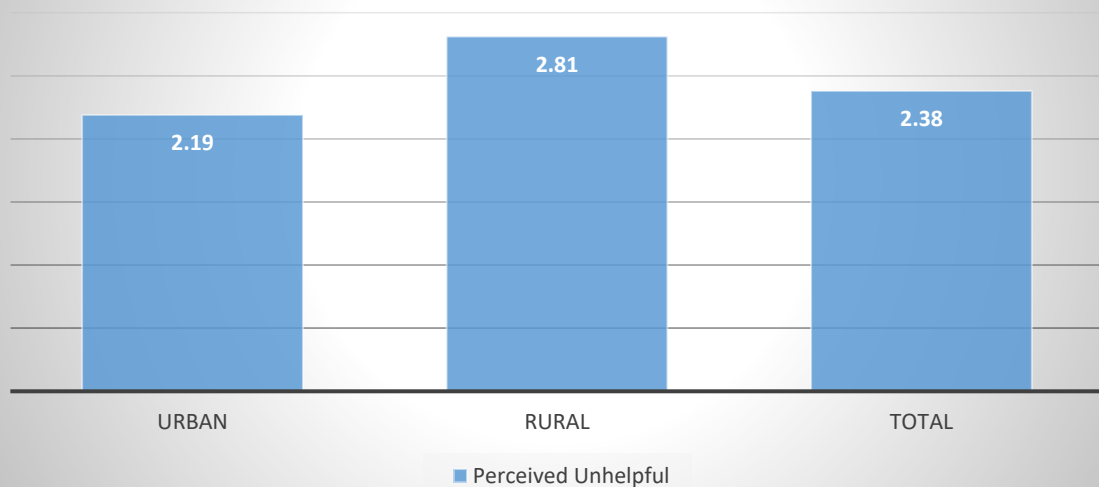
Average Perceived Discomfort Score (Higher Number= More Discomfort)



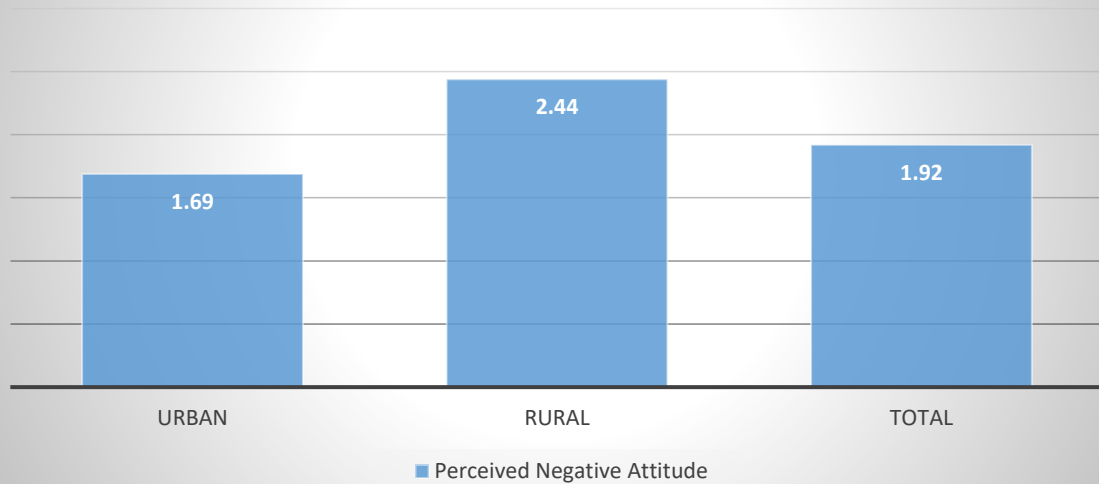
Average Perceived Judgemental Score (Higher Number= More Judgemental)



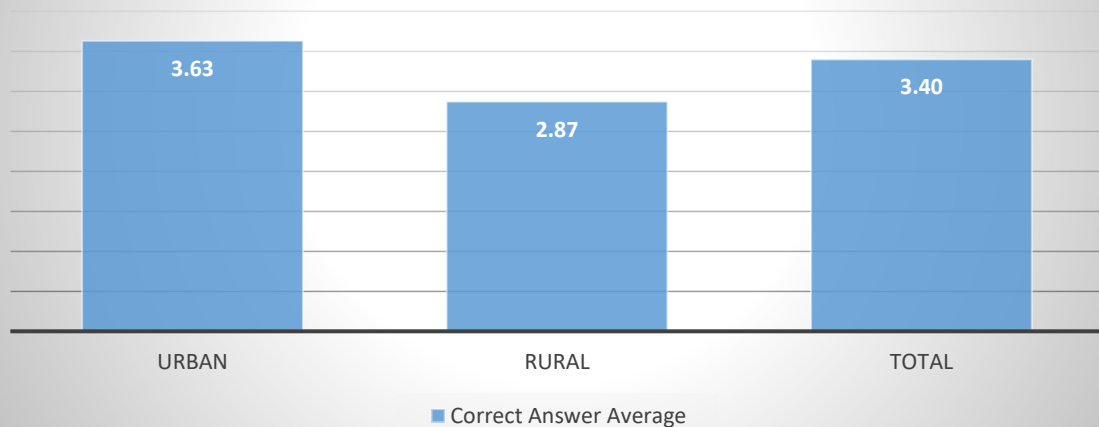
Average Perceived Unhelpful Score (Higher Number= More Unhelpful)



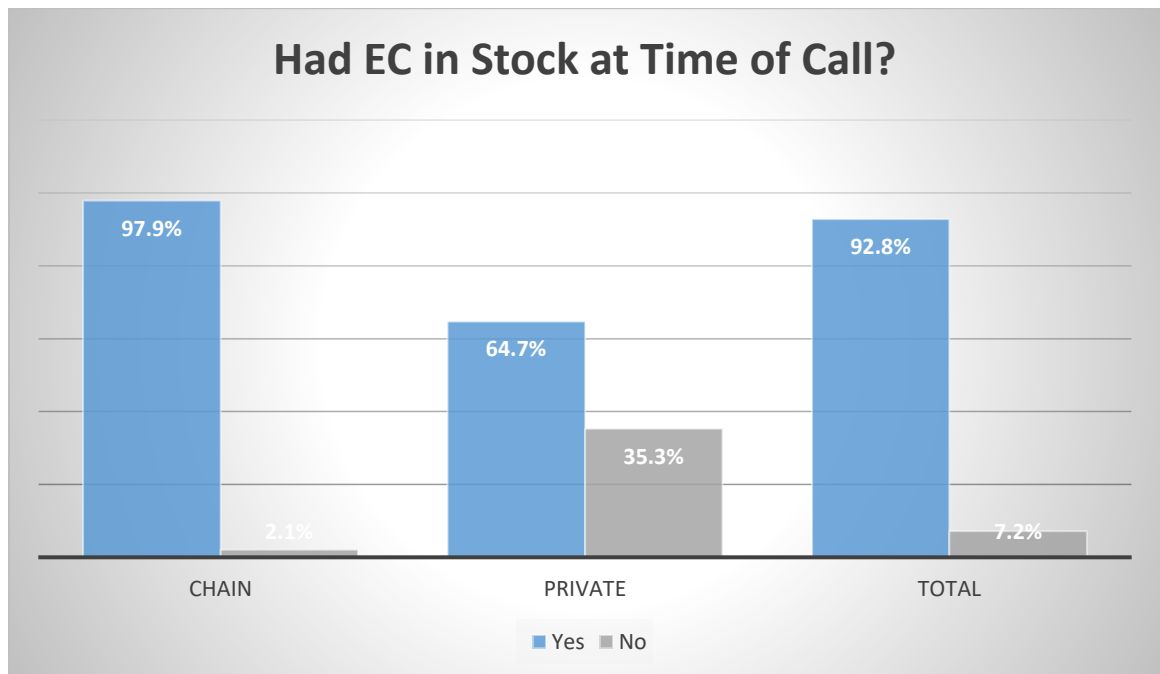
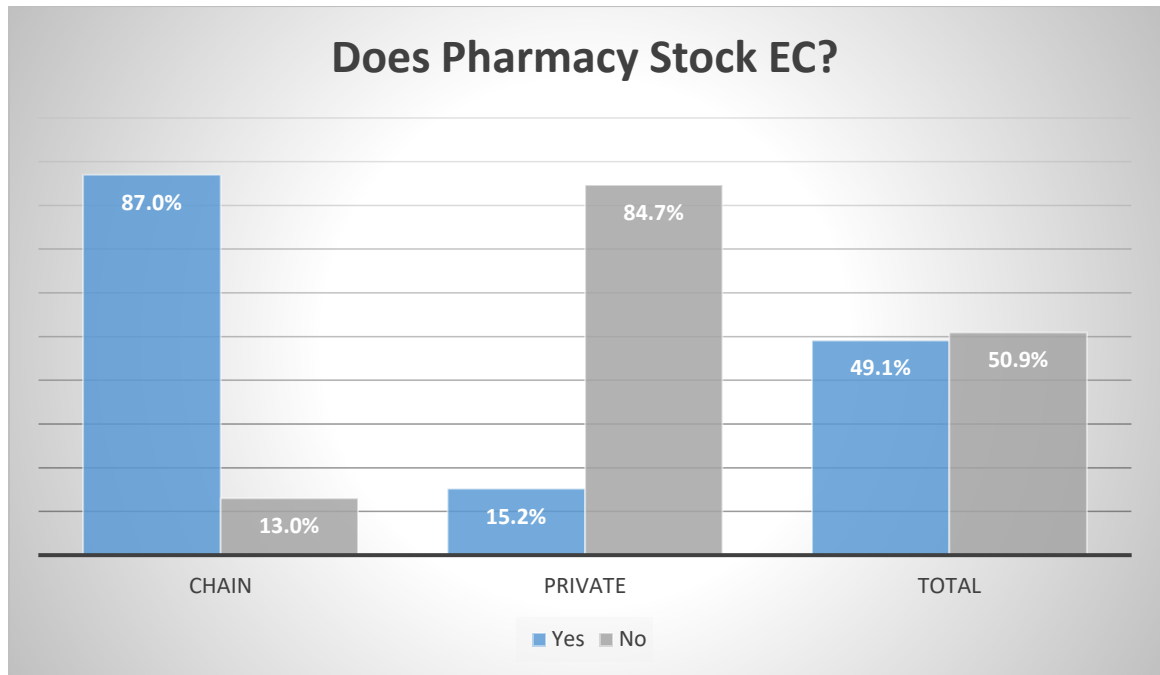
Average Perceived Negative Attitude Score (Higher Number= More Negative)



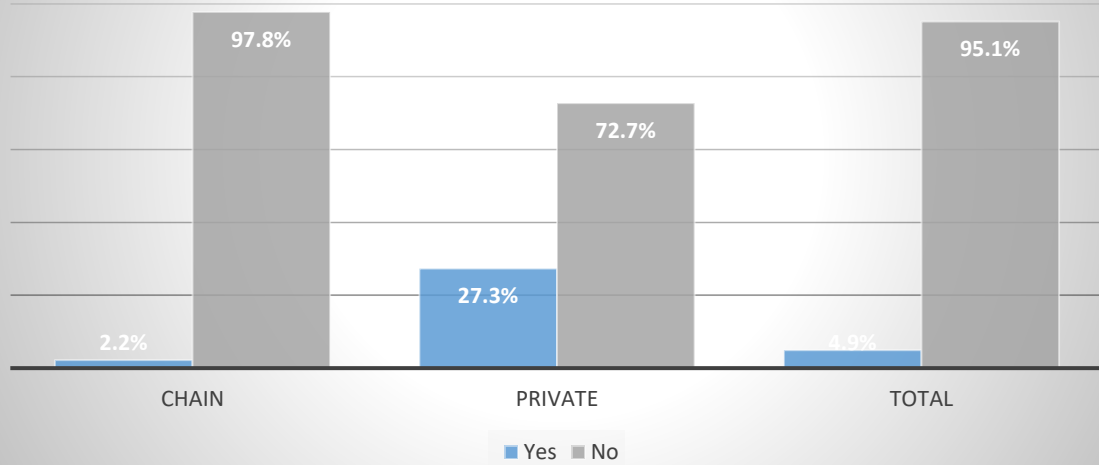
Average Overall EC Knowledge Correct Answers (Higher Number= More Answers Correct)



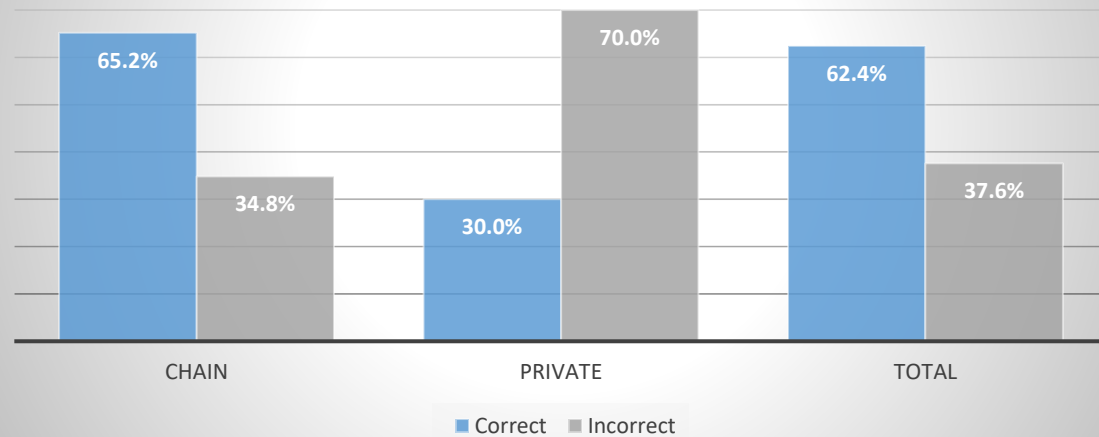
Appendix III: Significant Differences/ Associations Between Chain and Private Pharmacies



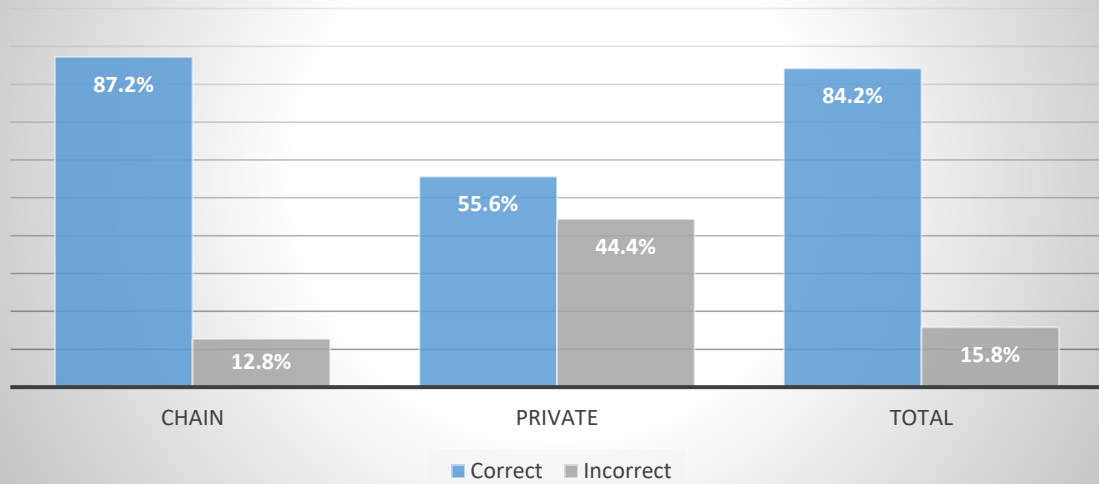
Need a Perscription to Purchase?



Correctly Answered that Adult is Not Required to Purchase?



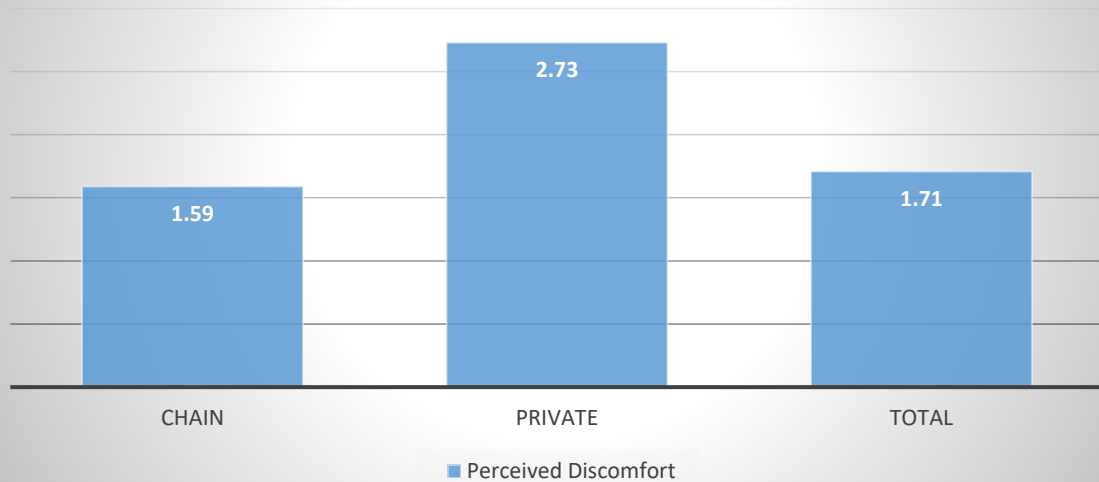
Correctly Stated that EC is not the Same as Seeking an Abortion?



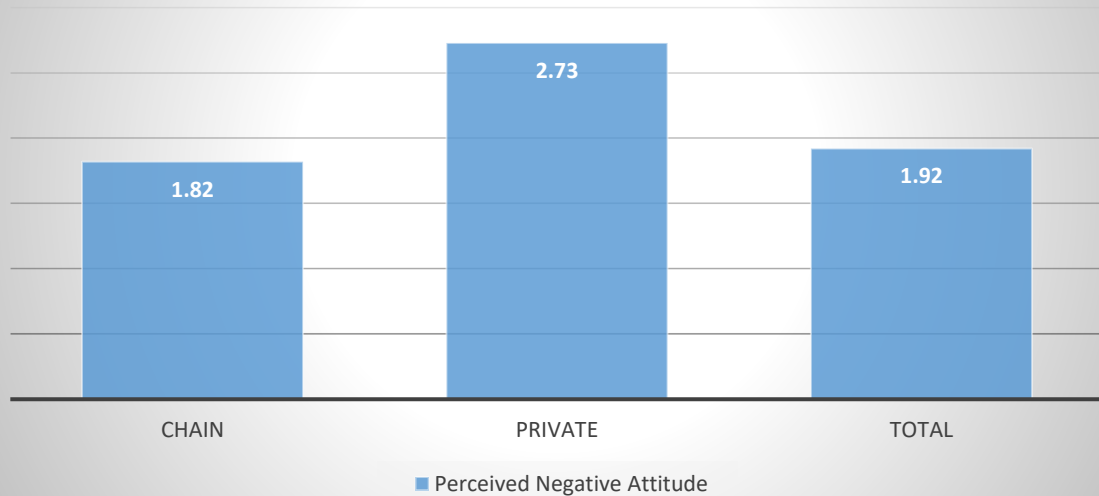
Average Cost of EC



**Average Perceived Discomfort: Range 0-5
(Higher Number= More Discomfort)**



**Average Perceived Negative Attitude: Range 0-5
(Higher Number= More Negative)**



Appendix IV: IRB Letter of Approval



*INSTITUTIONAL REVIEW BOARD
OFFICE OF RESEARCH INTEGRITY*

DATE: June 13, 2016

TO: Zona Ascensio

FROM: Western Kentucky University (WKU) IRB

PROJECT TITLE: [919278-1] Adolescent Access to Over-the-Counter Emergency Contraception in Kentucky Pharmacies

REFERENCE #: IRB 16-501

SUBMISSION TYPE: New Project

ACTION: APPROVED

APPROVAL DATE: June 13, 2016

REVIEW TYPE: Exempt from Full Board Review

Thank you for your submission of New Project materials for this project. The Western Kentucky University (WKU) IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a project design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Exempt from Full Board Review based on the applicable federal regulation.

Please note that any revision to previously approved materials must be approved by this office prior to initiation. Please use the appropriate revision forms for this procedure.

All UNANTICIPATED PROBLEMS involving risks to subjects or others and SERIOUS and UNEXPECTED adverse events must be reported promptly to this office. Please use the appropriate reporting forms for this procedure. All FDA and sponsor reporting requirements should also be followed.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to this office.

This project has been determined to be a Minimal Risk project.

Please note that all research records must be retained for a minimum of three years after the completion of the project.

If you have any questions, please contact Paul Mooney at (270) 745-2129 or irb@wku.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Western Kentucky University (WKU) IRB's records.

Curriculum Vitae

Zona J Ascensio

1418 Clayton Ct | Bowling Green, KY 42104 | 270.303.0262 | zona.ascensio@barrenriverhealth.org

EDUCATION

MPH: Master of Public Health

Public Health Education and Promotion

Western Kentucky University; Bowling Green, KY; May 2017 (in progress)

Elective Coursework in Public Health Research including Advanced Biostatistics, Epidemiology, and Research Methods

Thesis: "Pharmacy-Based Barriers to Adolescent Access to Over-the-Counter Emergency Contraception in Kentucky"

Bachelor of Arts

Spanish and Liberal Arts: Medical Anthropology (double major)

Murray State University; Murray, KY; May 2014

Degree Honors: Summa cum Laude

Study Abroad: Yucatan, Mexico

Thesis: "Cross-Cultural Curing: The Role of Traditional Medicine in the Yucatan and What Western Medicine Can Learn"

EMPLOYMENT AND PROFESSIONAL EXPERIENCE

Barren River District Health Department; Bowling Green, KY

August 2016-Present

Community Mobilization Coordinator

- Facilitates and coordinates the BRIGHT Coalition and health department community outreach endeavors
- Develops branch and program-specific service plans with collaboration from program owners
- Assists Planning, Quality and Communication team with BRIGHT Coalition meetings and Regional Mobilizing for Action through Planning and Partnerships (MAPP) Process
- Develops relationships with community agencies and the public to better identify shared goals and areas for collaboration
- Assists Community Health Planner and agency staff in developing grant applications
- Works to develop formalized collaborative relationships with post-secondary institutions as recommended by the Kentucky Department for Public Health and the Public Health Foundation (Build Academic Health Department)
- Participates fully in agency's strategic planning, CHIP, CHA and Public Health Accreditation processes.
- Prepares reports and presentations as requested by staff and community partners
- Assists with the development and implementation of marketing campaigns involving external agencies
- Identifies agency's chain of command and management system for emergency response
- Participates in Bioterrorism and Emergency Preparedness drills/exercises

WKU: Department of Public Health; Bowling Green, KY
Graduate Assistant

January 2015-Present

- Assists in teaching a senior-level undergraduate Women's Health course: Monitors class discussion boards, grades quizzes/exams, final paper and other assignments and records grades in grade book; answers student questions and maintains course content on Blackboard
- Translates surveys and documents into Spanish
- Develops tables and charts, maps competencies, finds and downloads forms, and synthesizes materials essential for the Council on Education for Public Health (CEPH) accreditation self-study
- Developed electronic resource file for CEPH accreditation self-study
- Assists faculty members with meetings, record keeping, and other miscellaneous projects
- Uses SPSS to analyze surveys for various local health departments and faculty research
- Synthesizes MPH admissions information into an Excel spreadsheet for future analysis
- Develops surveys using Qualtrics survey software
- Assists undergraduate and graduate students with independent writing projects (Honors theses; masters capstones, etc.)
- Writes press releases for the College of Health and Human Services and WKU News on behalf of the Department of Public Health
- Acts as webmaster to the Department of Public Health website

Murray State University: Psychology Department; Murray, KY
Student Office Associate

August 2013-August 2014

- Aided the administrative assistant in meeting the various organizational needs of the department while maintaining the required confidentiality
- Copied, sorted and filed paperwork such as testing materials, student and clinical patient records, and faculty application packages
- Searched for books, journal articles, or other educational materials for professors and the administrative assistant upon request.
- Performed routine clerical functions
- Proctored exams and assisted faculty with class-related activities as needed

Yahoo! News and Contributor Network/ Demand Media; Online
Freelance Journalist

January 2010- May 2013

- Wrote feature articles, bulletins, sales letters, and other related informative, marketing and promotional material
- Conducted research to obtain factual information and authentic detail, using internet research as well as reviewing newspaper accounts, diaries, and interviews
- Named as one of the top contributors for 2012 and 2013
- Named featured contributor in the green living, entertainment, and lifestyle categories

RESEARCH AND REPORTS

Ascensio, Zona J. *Pharmacy-Based Barriers to adolescent Access to Over-the-Counter Emergency Contraception in Kentucky* (Graduate Thesis; Western Kentucky University, 2017)

Ascensio, Zona J. and Shearer, Darlene S. *As Long as I'm Not Hurting Anyone Else: Perceived Personal Threat versus Altruistic Motivations for Smoking Cessation in Todd County, Kentucky* (Independent Study in Community Health Term Paper; Ongoing Research: Western Kentucky University, 2016)

Ascensio, Zona J and Farrell, Colin T. *The Effect of Exposure to Prison Violence on Factors Predicting Recidivism* (Advanced Biostatistics Term Paper; Ongoing Research: Western Kentucky University, 2016)

Shearer, Darlene S. and **Ascensio, Zona J.** *Analysis of Responses to the 2015 Community- Wide Survey Submitted to the BRIGHT Coalition* (Report to the Barren River Initiative to Get Healthy Together (BRIGHT) coalition and Barren River District Health Department: Western Kentucky University, 2015)

Ascensio, Zona J. *From Ethnography to Magical Realism: Fathoming other Worldviews through Literature* (Spanish Senior Capstone: Murray State University, 2014)

Ascensio, Zona J. *Cross-Cultural Curing: The Role of Traditional Medicine in the Yucatan and what Western Medicine Can Learn* (Undergraduate Thesis: Murray State University, 2013)

PROFESSIONAL PRESENTATIONS

"Pharmacy-Based Barriers to Adolescent Access to Over-the-Counter Emergency Contraception in Kentucky" at the Kentucky Public Health Association Conference (April 12, 2017)

"Pharmacy-Based Barriers to Adolescent Access to Over-the-Counter Emergency Contraception in Kentucky" at the Western Kentucky University Student Research Conference (March 25, 2017)

"No Such Thing as Safe Secondhand Smoke in Todd County, KY" at the Kentucky Public Health Association Conference (April 12, 2016)

"The Effect of Family Participation in Traditional Culture on American Indian and Alaska Native Youth Suicide Risk" at the Western Kentucky University Student Research Conference (March 28, 2015)

"From Ethnography to Magical Realism: Fathoming other Worldviews through Literature" at the Murray State University Scholars Week (April 15, 2014)

"Tour of a Traditional Mayan Pharmacy in Yucatan Mexico" at the Murray State University Liberal Arts Research Forum (November 20, 2013)

AWARDS AND HONORS

- **Outstanding College of Health and Human Services Graduate Student:** Awarded for outstanding academic performance and service to the College of Health and Human Services and to the Department of Public Health. One of 7 graduate award recipients specifically recognized at the 2017 commencement ceremony (April, 2017).
- **Academic Excellence in Master of Public Health:** Awarded by Western Kentucky University's Department of Public Health for overall academic achievement in the Master of Public Health program during the College of Health and Human Services annual awards banquet (April, 2017).
- **College of Health and Human Services Graduate Tuition Scholarship:** Awarded by Western Kentucky University's College of Health and Human Services for academic prowess, peer mentorship, and commitment to the public health profession (May, 2016).
- **Outstanding Service Award:** Recognized for exceptional service to the Department of Public Health during the College of Health and Human Services awards banquet at Western Kentucky University (April, 2016).

- **Dedicated Service Award:** Recognized for outstanding service to the WKU chapter of the Kentucky Public Health Association during the KPHA awards breakfast (April, 2016).
- **Outstanding Spanish Student:** Recognized for overall academic achievement in the Spanish major during the Honors Day ceremony at Murray State University (May, 2014).
- **Outstanding Service Award:** Recognized for exceptional service to the International Cultures and Languages Association during the Department of Modern Languages' Year End Banquet at Murray State University (May, 2014).
- **Outstanding Senior in Spanish:** Recognized for academic accomplishments in Spanish during the senior year during the Department of Modern Languages' Year End Banquet at Murray State University (May, 2014).
- **International Travel Grant:** Awarded by the Murray State University College of Humanities and Fine Arts for study abroad in Merida, Yucatan, Mexico (November, 2012).

OUTREACH AND VOLUNTEER ACTIVITIES

- **Public Health Undergraduate-Graduate Associated Students (PHUGAS)** (October 2016-Present) Co-founder of an organization that serves as a medium for student representation and engagement in the shared governance of Western Kentucky University's Public Health Programs (BSPH and MPH).
- **Graduate Representative to the CEPH Transition Steering Committee** (November 2016-Present) Voting member on committee to facilitate WKU's Public Health Program's transition to new accreditation criteria.
- **Graduate Representative to the Public Health Program Committee** (October 2016-Present) Voting member on committee for both the Bachelor of Public Health and Master of Public Health programs.
- **Kentucky Public Health Assistance and Support Teams (K-PHAST) training** (September 2016- January 2017) Assisted with program coordination by acting as liaison to the Barren River District Health Department's Epidemiology Rapid Response Team, to WKU's Public Health Faculty, and to the Public Health student body to bring this training to WKU for the first time.
- **Student Representative to the Building Epidemiology Capacity in Kentucky (BECKY) project** (Fall 2016) Attended teleconferences and annual BECKY conference on behalf of WKU's Public Health student body.
- **International Education Week: The Bigger Picture of Global Public Health** (Fall 2016) Planned, coordinated, headed recruitment for major departmental event focusing on global health issues on behalf of WKU's Department of Public Health.
- **Student Representative to the MPH Curriculum Committee** (May 2015- May 2016): Confidentially brings student concerns to the MPH faculty and contributes to processes relating to accreditation and the program in general.
- **Progressive Agricultural Safety Day** (September 2015): Developed, directed and participated in short role-playing scenarios to teach 600 local fourth graders about internet safety on behalf of KPHA.
- **International Education Week: Public Health in a Global World Planning Committee** (Fall 2015): Worked with representatives from Western Kentucky University's

Department of Public Health to plan and implement a new event to promote awareness of public health issues around the world.

- **Chinese New Year/Mardi Gras Planning Committee** (Fall 2013-Spring 2014): Met with representatives from Murray State University's Food Services and from the Department of Modern Languages to plan two major joint events for Chinese New Year and Mardi Gras.
- **ESL Conversation Partner** (Fall 2013-Spring 2014): Met weekly with small groups of international students to help strengthen their English speaking skills.
- **Campus International Ambassador** (Fall 2013): Welcomed new international students to campus, planned events and outings to introduce them to the area, and assisted them as necessary.
- **Campus Safe Zone Participant** (Fall 2013-Fall 2014): Attended trainings to better understand LGBTQ issues and how to sensitively address the various needs of this community on campus.

ORGANIZATIONS

- **Public Health Undergraduate-Graduate Associated Students (PHUGAS):** Fall 2016-Present
 - President: Spring 2017
 - Vice President: Fall 2016
- **Kentucky Public Health Association:** Spring 2015- Present
 - Historian/ Social Media Coordinator: Summer 2015-Fall 2016
- **International Cultures and Languages Association:** Spring 2012- Fall 2014
 - Vice president: Fall 2013-Fall 2014
- **Alpha Mu Gamma Foreign Language Honor Society:** Fall 2013- Present
- **Lambda Alpha Anthropology Honor Society:** Spring 2013- Present
- **Phi Kappa Phi National Honor Society:** Spring 2013- Present

TECHNOLOGY SKILLS

- **Word processing and Spreadsheets:** Microsoft Word, Microsoft Excel, Google Docs, Google Spreadsheets
- **Statistical Software:** SPSS, SAS
- **Survey Software:** Qualtrics, Survey Monkey
- **Database management:** Microsoft Access
- **Webpage Design:** OU Campus, Microsoft FrontPage
- **Graphic Design:** Adobe Photoshop, Microsoft Publisher
- **Other skills:** Knowledge of and experience with HTML, XML, Search Engine Optimization (SEO), Klipfolio, and Google Analytics

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